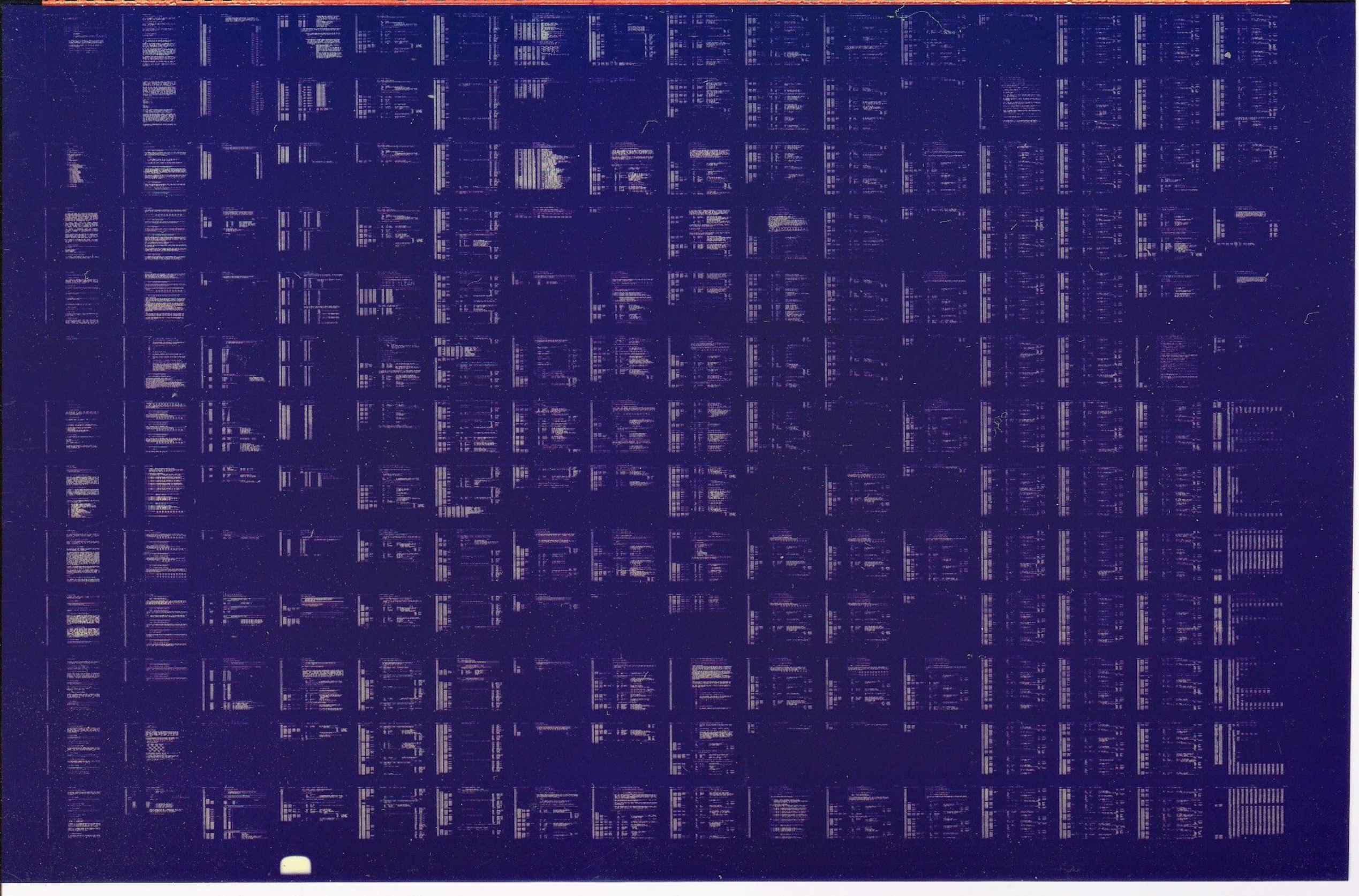
DMV11 DMV11 MCTRL DIAG# 1 AH-F262A-MC MAY 1981
M8053 M8064 CVDMAA0 FICHE 1 OF 2



DMV11 DMV11 MCTRL DIAG# 1 AH-F262A MC
M8053 M8064 CVDMAA0 FICHE 2 OF 2

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1
2                               .TITLE CVDMAA0 DMV11 MCTRL DIAG #1
3                               .SBTTL PROGRAM DOCUMENT
4                               .REM ^
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6
7
8                                           I D E N T I F I C A T I O N
9                                           ---------------------------
10
11                              PRODUCT CODE:   AC-F261A-MC
12
13                              PRODUCT NAME:   CVDMAA0 DMV-11 MICRO-CONTROLLER STATIC DIAGNOSTIC PART 1
14
15                              PRODUCT DATE:   JANUARY 1981
16
17                              MAINTAINER:     DIAGNOSTICS MERRIMACK  CC:38P
18
19                              AUTHORS:        CHRIS BRIENEN
20                                              RAY MARSHALL
21
22                              PURPOSE:        THIS DIAGNOSTIC IS DESIGNED TO PERFORM STATIC LOGIC TESTS FOR
23                                              THE M8053 OR M8064 (HEREAFTER REFERRED TO AS THE DMV OR DMV-11)
24
25
26
27                              THE INFORMATION IN THIS DOCUMENT IS  SUBJECT  TO  CHANGE WITHOUT
28                              NOTICE  AND  SHOULD  NOT BE CONSTRUED AS A COMMITMENT BY DIGITAL
29                              EQUIPMENT CORPORATION.  DIGITAL EQUIPMENT CORPORATION ASSUMES NO
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41                              DEC             DECUS           DECTAPE
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HISTORY

REV	DATE	REASON
0	14-JAN-81	INITIAL RELEASE

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:

PDP-11/03 OR PDP-11/23
16K WORDS OF MEMORY
CONSOLE TERMINAL
M8053 OR M8064 COMMUNICATIONS INTERFACE

3.0 PRELIMINARY PROGRAM REQUIREMENTS

THIS PROGRAM (CVDMA) 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.

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 AS FOLLOWS: 11/03 = 100 SEC, 11/23 = 50 SECONDS.

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
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
CVDMA-A-0
DMV-11 U-CONTRL LOGIC DIAG - PART 1 OF 2
UNIT IS M8053 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(RT)/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) CONTAINING 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 "# 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 "# 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.

6.3.2 RESTART COMMAND

```
**************************************************************
RES(TART)/TESTS:<TEST-LIST>/PASS:<PASS-CNT>/FLAGS:
   <FLAG-LIST>/UNITS:<UNIT-LIST>
**************************************************************
```

6.3.2.1 TESTS, PASS, AND FLAGS SWITCHES

<TEST-LIST>, <PASS-CNT>, AND <FLAG-LIST> ARE AS IN THE START COMMAND.

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

<UNIT-LIST> IS A SEQUENCE OF DECIMAL NUMBERS (0,1 ETC.) OR RANGES OF DECIMAL NUMBERS (0-5, 8-10 ETC.) THAT SPECIFY THE UNITS TO BE TESTED. THE NUMBERS ARE SEPARATED BY COLONS. THE NUMBERS MAY RANGE FROM 0 THRU N-1 (N IS THE NUMBER OF UNITS SPECIFIED IN THE PREVIOUS START COMMAND). THE NUMBER INDICATES THE POSITION OF THE P-TABLE AS THE DATA WAS ENTERED DURING THE HARDWARE DIAGLOGUE. THE UNITS WHICH ARE SELECTED MUST NOT HAVE BEEN DROPPED BY THE DROP COMMAND. SEE THE DISCUSSION OF ADD AND DROP COMMANDS BELOW. DEFAULT IS TO TEST ALL UNITS WHICH HAVE NOT BEEN DROPPED BY A DROP COMMAND.

6.3.2.3 EFFECT OF RESTART COMMAND

THE RESTART COMMAND DIFFERS FROM THE START COMMAND IN THAT THE P-TABLES FROM THE PREVIOUS START COMMAND (THERE MUST HAVE BEEN ONE) ARE USED, INSTEAD OF NEW ONES BEING BUILT. THE UNITS SWITCH GIVES THE ABILITY TO SELECT A SUBSET OF THESE. THE SOFTWARE DIALOGUE MAY OPTIONALLY BE REEXECUTED (OPERATOR WILL BE ASKED). THE COMMAND CAN BE USED AFTER COMMAND MODE HAS BEEN REENTERED IN ANY OF THE THREE NORMAL WAYS: A) THE REQUESTED NUMBER OF PASSES HAVE BEEN MADE B) AN ERROR WAS ENCOUNTERED WITH THE HALT ON ERROR FLAG SET C) A CONTROL/C WAS ENTERED BY THE OPERATOR.

6.3.3 CONTINUE COMMAND

```
**************************************************************
CON(TINUE)/PASS:<PASS-CNT/FLAGS:<FLAG-LIST>
**************************************************************
```

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

<PASS-CNT> IS SAME AS IN START COMMAND, BUT THE DEFAULT IS THE UNSATISFIED PASS-CNT FROM THE PREVIOUS START OR RESTART. IF NONE REMAINS, THE DEFAULT IS NON-ENDING EXECUTION.

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

<FLAG-LIST> IS SAME AS IN START COMMAND, BUT UNSPECIFIED FLAGS RETAIN THEIR CURRENT VALUE.

6.3.3.3 EFFECT OF CONTINUE COMMAND

CONTINUE MUST FOLLOW A START OR RESTART, AND COMMAND MODE MUST HAVE BEEN ENTERED DUE TO A HALT ON ERROR OR A CONTROL/C. THE EFFECT OF THE COMMAND IS TO GO TO THE BEGINNING OF THE TEST THAT WAS BEING EXECUTED WHEN THE HALT OR CONTROL/C TOOK PLACE. SOFTWARE DIALOGUE MAY OPTIONALLY BE REEXECUTED. HARDWARE PARAMETERS MAY NOT BE CHANGED.

6.3.4 PROCEED COMMAND

****
PRO(CEED)/FLAGS:<FLAG-LIST>
****

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

<FLAG-LIST> IS AS IN THE START COMMAND, BUT UNSPECIFIED FLAGS RETAIN THEIR CURRENT VALUE.

6.3.4.2 EFFECT OF PROCEED COMMAND

PROCEED MUST FOLLOW A START, RESTART, ... CONTINUE. COMMAND MODE MUST HAVE BEEN ENTERED VIA A HALT ON ERROR. THE EFFECT OF THE COMMAND IS TO BEGIN EXECUTION AT THE LOCATION FOLLOWING THE ERROR CALL. NEITHER HARDWARE NOR SOFTWARE PARAMETERS MAY BE ALTERED.

6.3.5 ADD COMMAND

****
ADD/UNITS:<UNIT-LIST>
****

6.3.5.1 UNITS SWITCH (/UNITS:<UNIT-LIST>

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

6.3.5.2 EFFECT OF ADD COMMAND

THE UNITS SPECIFIED ARE ADDED TO THE TEST SEQUENCE. EACH 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.

553
554 6.3.8.2 EFFECT OF DISPLAY COMMAND
555
556 THE HARDWARE P-TABLES FOR ALL UNITS UNDER TEST ARE PRINTED
557 OUT IN THE FORMAT IN WHICH THEY WERE ENTERED. ANY UNITS
558 THAT WERE DROPPED BY THE OPERATOR 'DROP' COMMAND ARE SO
559 DESIGNATED.
560
561
562 6.3.9 FLAGS COMMAND
563
564 **********
565 FLA(GS)
566 **********
567
568
569 6.3.9.1 EFFECT OF FLAGS COMMAND
570
571 THE CURRENT SETTINGS OF ALL FLAGS ARE PRINTED.
572
573
574 6.3.10 ZFLAGS COMMAND
575
576 **********
577 ZFL(AGS)
578 **********
579
580
581 6.3.10.1 EFFECT OF ZFLAGS COMMAND
582
583 ALL FLAGS ARE CLEARED.
584
585
586 6.3.11 CONTROL CHARACTERS
587
588 A CONTROL C (C) ENTERED DURING THE EXECUTION OF A DIAGNOSTIC CAUSES
589 A RETURN TO COMMAND MODE.
590
591 A CONTROL Z (Z) ENTERED DURING ONE OF THE THREE OPERATOR
592 DIALOGUES- HARD CORE QUESTIONS (SEE 6.2),HARDWARE DIALOGUE
593 (SEE 6.3.1.5), OR SOFTWARE DIALOGUE (SEE 6.3.1.5) CAUSES THE
594 DEFAULTS TO BE TAKEN FOR THE REMAINDER OF THAT DIALOGUE.
595
596 A CONTROL O (O) ENTERED DURING THE EXECUTION OF A DIAGNOSTIC
597 CAUSES ALL TELETYPE OUTPUT TO BE SURPRESSED FOR THE
598 REMAINDER OF THE DIAGNOSTIC OR UNTIL ANOTHER O IS TYPED,
599 WHICH RESTORES NORMAL TELETYPE OUTPUT.
600
601
602 6.3.12 HARDWARE PARAMETERS
603
604 THE FOLLOWING 3 QUESTIONS WILL BE ASKED ON A START COMMAND.
605 THE VALUE LOCATED TO THE LEFT OF THE QUESTION MARK IS THE
606 DEFAULT VALUE THAT WILL BE TAKEN ON A CARRIAGE RETURN
607 RESPONSE.
608

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 : (O) 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 "# 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 CONSTRUCT A SET OF P-TABLES. ASSUME THAT WE HAVE 16 UNITS, AND THAT THERE ARE THREE HARDWARE PARAMETERS FOR EACH (THREE SLOTS IN THE P-TABLE, THREE HARDWARE QUESTIONS IN THE DIALOGUE). LET THE DESIRED VALUE FOR THE FIRST PARAMETER BE THE NUMBER 75 FOR ALL 16 TABLES. LET THE DESIRED VALUE FOR THE SECOND PARAMETER BE EQUAL TO THE UNIT NUMBER (0,1,2,...,15) EXCEPT FOR UNIT 12, WHICH SHOULD RECEIVE THE VALUE 11. LET THE DESIRED VALUE FOR THE THIRD PARAMETER BE THE NUMBER 76 FOR THE FIRST 7 UNITS AND THE NUMBER 77 FOR THE LAST 9 UNITS.

THE FOLLOWING DIALOGUE WOULD ACCOMPLISH THIS GOAL:

```
# UNITS (D) ? 16
UNIT 0
<QUESTION 1> ? 75
<QUESTION 2> ? 0-6
<QUESTION 3> ? 76

UNIT 7
<QUESTION 1> ?
<QUESTION 2> ? 7-11,,13-15
<QUESTION 3> ? 77
```

THE FIRST TIME THE SERIES IS ASKED, SLOT ONE RECEIVES A 75 IN ALL 16 TABLES. SLOT TWO RECEIVES THE VALUES 0,1,2,...,6 IN TABLES 0 THRU 6 AND A CONSTANT 6 IN TABLES 7 THRU 15. SLOT THREE RECEIVES A CONSTANT 76 IN ALL 16 TABLES.

THE SECOND TIME THRU THE SERIES, TABLES 7 THRU THE END ARE GOING TO BE AFFECTED (NOTE THAT THIS PIECE OF INFORMATION IS PRINTED OUT FOR THE THE OPERATOR IN THE FORM 'UNIT XX' AT THE BEGINNING OF EACH SERIES). QUESTION 1 IS RESPONDED TO BY A <CR>, SO SLOT ONE STAYS AT CONSTANT 75 IN TABLES 7 THRU 15, SINCE NO NEW EXPLICIT VALUES ARE TYPED IN. SLOT TWO GETS THE VALUES 7,8,9,10,11 IN TABLES 7 THRU 11, AND GETS AN 11 IN SLOT 12, AND GETS THE VALUES 13,14,15 IN TABLES 13 THRU 15. SLOT THREE GETS THE VALUE 77 IN TABLES 7 THRU 15.

THE DIALOGUE IS TERMINATED WHEN THE SOFTWARE RECOGNIZES THAT 16 EXPLICIT VALUES HAVE BEEN GIVEN FOR AT LEAST ONE QUESTION (NAMELY QUESTION 2).

```
8.0 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.
```

```
774                     ;* THEN, REPEAT THIS USING EACH OF THE REMAINING CSR'S, BSEL1-BSEL17.  WHEN BSEL1
775                     ;* IS BEING TESTED, THE PROGRAM ALWAYS SETS BIT 7 IN THE DATA PATTERN SO THAT
776                     ;* RUN WILL NOT BE CLEARED, AND IT ALWAYS CLEARS BIT6 SO THAT MCLR WILL NOT BE
777                     ;* SET.
778                     ;*
779                     ;*   DATA PATTERN B = 125, 252, 000, 377, 001, 002, 004, 010, 020, 040, 100,
780                     ;*                    200, 376, 375, 373, 367, 357, 337, 277, 177, 000
781                     ;*****************************************************************************
782
783
784                     ;*****************************************************************************
785                     ;*      TEST 5  <BASIC MASTER CLEAR>
786                     ;*
787                     ;* PERFORM AN INITIAL MASTER CLEAR. WRITE 377 INTO BSEL0 AND READ AND CHECK IT.
788                     ;* THEN, ISSUE A MASTER CLEAR AND READ AND CHECK BSEL0 FOR 000.
789                     ;*****************************************************************************
790
791
792                     ;*****************************************************************************
793                     ;*      TEST 6  <BUS RESET>
794                     ;*
795                     ;* PERFORM AN INITIAL MASTER CLEAR.  WRITE 377 INTO BSEL0 AND READ AND CHECK
796                     ;* IT. THEN, ISSUE A RESET INSTRUCTION, STALL FOR COMPLETION, AND READ AND
797                     ;* CHECK BSEL0 FOR 000.
798                     ;*****************************************************************************
799
800
801                     ;*****************************************************************************
802                     ;*      TEST 7  <CSR, MAINTENANCE MICROCODE INTERACTION>
803                     ;*
804                     ;* THIS TEST INVOKES THE MAINTENANCE REQUEST MECHANISM THROUGH WHICH THE LSI-11
805                     ;* AND 6502 CAN COMMUNICATE.    FIRST, A MASTER CLEAR IS DONE WITH ONLY BIT 0
806                     ;* (MREQ) SET IN BSEL1. THE PROGRAM THEN CHECKS FOR THE SETTING OF BSEL2 BIT 7
807                     ;* (MRDY) BY THE MAINTENANCE MICROCODE WITHIN ABOUT 50 MICRO-SEC., AND IF MRDY
808                     ;* DOES NOT GET SET, AN ERROR IS REPORTED.
809                     ;*
810                     ;* NEXT, THE PROGRAM LOADS SEL4 WITH 000010 AND BSEL6 WITH 125. THEN, ALL CSR'S
811                     ;* ARE READ AND CHECKED FOR EXPECTED CONTENTS.
812                     ;*
813                     ;* BSEL2 IS THEN LOADED WITH A WRITE COMMAND, WHICH SHOULD CAUSE THE MICROCODE
814                     ;* TO  TRANSFER  THE  125  INTO  BSEL0. ALL CSR'S ARE THEN READ AND CHECKED FOR
815                     ;* EXPECTED CONTENTS.
816                     ;*
817                     ;* THEN, THE PROGRAM LOADS 252 INTO BSEL0 AND READS AND CHECKS ALL CSR'S. BSEL2
818                     ;* IS THEN LOADED  WITH  A  READ  COMMAND, WHICH SHOULD CAUSE THE MICROCODE TO
819                     ;* TRANSFER THE 252 INTO BSEL6.  ALL CSR'S ARE READ AND CHECKED.
820                     ;*****************************************************************************
821
822
823                     ;*****************************************************************************
824                     ;*      TEST 8  <RUN FLIP-FLOP>
825                     ;*
826                     ;* THE PROGRAM PUTS THE MICROCODE INTO THE MAINTENANCE LOOP. A 125 CHARACTER
827                     ;* IS LOADED INTO BSEL6 AND A REQUEST IS MADE TO WRITE THE CONTENTS OF BSEL6
828                     ;* INTO BSEL0. THE PROGRAM THEN READS AND CHECKS BSEL0 TO CONTAIN 125.
829                     ;* NEXT, THE RUN FLIP-FLOP IS CLEARED BY LOADING A 0 INTO RUN (BSEL1 BIT 7).
```

```
830                     ;* BSEL0 IS THEN CLEARED AND THE REQUEST IS MADE AGAIN TO WRITE THE CONTENTS
831                     ;* OF BSEL6 INTO BSEL0. THE PROGRAM STALLS FOR 50 MICRO-SEC. AND CHECKS FOR
832                     ;* MRDY (BSEL2 BIT 7) NOT SET, AND BSEL0 STILL CLEARED.
833                     ;* THEN, THE PROGRAM SETS THE RUN FLIP-FLOP AGAIN BY LOADING A 1 INTO RUN,
834                     ;* AND CHECKS FOR MRDY SET WITHIN 50 MICRO-SEC. AND BSEL0 = 125.
835                     ;*****************************************************************************
836
837
838                     ;*****************************************************************************
839                     ;*      TEST 9  <LOW RAM (00-0F) SCRATCHPAD>
840                     ;*
841                     ;* THIS TEST FIRST PERFORMS AN ADDRESSING TEST OF RAM LOCATIONS (00-0F), BY
842                     ;* WRITING THE ADRS INTO EACH LOCATION AND AFTER EACH WRITE, ALL THE LOCATIONS
843                     ;* ARE READ AND CHECKED FOR EXPECTED CONTENTS.
844                     ;*
845                     ;* THEN, THE TEST PERFORMS READ/WRITE DATA TESTING OF RAM LOCATIONS 00-0F,
846                     ;* BY WRITING, READING, AND COMPARING ALL BYTES OF DATA PATTERN B IN EACH
847                     ;* LOCATION.
848                     ;*   DATA PATTERN B = 125, 252, 000, 377, 001, 002, 004, 010, 020, 040, 100,
849                     ;*                    200, 376, 375, 373, 367, 357, 337, 277, 177, 000
850                     ;*****************************************************************************
851
852
853                     ;*****************************************************************************
854                     ;*      TEST 10 <DATA RAM MOVING INVERSIONS (LOC'S 0018-01FF HEX)>
855                     ;*
856                     ;* GENERAL DESCRIPTION:
857                     ;*  FIRST, THE 2K BYTE LOCATIONS IN RAM ARE LOADED WITH 0'S (SEE NOTE BELOW).
858                     ;* THEN, THE FIRST LOCATION IS READ AND CHECKED, A SINGLE 1 IS WRITTEN INTO
859                     ;* THE LOW BIT POSITION, AND THIS IS READ AND CHECKED. THIS IS DONE FOR ALL
860                     ;* BYTES IN THE RAM, BY INCREMENTING THE ADDRESS TO POINT TO THE NEXT RAM
861                     ;* LOCATION.
862                     ;*  THEN, THE NEXT BIT POSITION IS CHOSEN TO INSERT A 1, AND ALL LOCATIONS
863                     ;* ARE READ, WRITTEN, AND READ AS BEFORE. THIS IS CONTINUED FOR ALL BIT
864                     ;* POSITIONS UNTIL THE ENTIRE RAM IS WRITTEN TO ALL 1'S. THE ABOVE OPERATIONS
865                     ;* ARE PERFORMED A SECOND TIME, WITH 0'S INSERTED INTO THE RAM INSTEAD OF 1'S,
866                     ;* THIS RESULTS IN THE ENTIRE RAM BEING WRITTEN TO ALL 0'S.
867                     ;*  THIS TEST CONSTITUTES A THOROUGH TEST OF THE RAM. IT IS CAPABLE OF
868                     ;* DETECTING THE FOLLOWING FAULTS :  STUCK ADDRESS BITS, UNI- AND BI-DIRECT-
869                     ;* IONAL COUPLING BETWEEN ADDRESS BITS, STUCK MEMORY BITS, AND UNI- AND
870                     ;* BI-DIRECTIONAL COUPLING BETWEEN MEMORY BITS IN BOTH ROWS AND COLUMNS OF THE
871                     ;* MEMORY MATRIX.
872                     ;*
873                     ;* NOTE:
874                     ;*  THIS TEST DOES NOT CHECK LOCATIONS 0010-001F, SO THAT THE PRIMARY CSR'S
875                     ;* ARE NOT WRITTEN. IT DOES TEST LOCATIONS 0000-000F (SCRATCHPAD RAM) AND
876                     ;* LOCATIONS 0020-002F (SECONDARY CSR'S), AS WELL AS 0030-0800 (BASIC RAM).
877                     ;*
878                     ;* THE 'TMP#' REGISTERS ARE USED HERE TO CONTAIN THE VARIOUS CONSTANTS &
879                     ;* VARIABLES USED THROUGHOUT THIS TEST.  A LIST OF THEIR ASSIGNMENTS SEEMS
880                     ;* USEFUL SO HERE IT IS:
881                     ;*
882                     ;*      TMP0    POINTS TO THE FIRST LOCATION AFTER THE SELECT REGISTERS.
883                     ;*
884                     ;*      TMP1    ----
885                     ;*
```

```
886                 ;*      TMP2    TEST PATTERN ID CODE -- UNUSED BY THIS TEST.
887                 ;*
888                 ;*      TMP3    TEST DATA PATTERN INDEX -- UNUSED BY THIS TEST.
889                 ;*
890                 ;*      TMP4    TEST DATA PATTERN.  THE HIGH BYTE IS THE PATTERN BEING WRITTEN
891                 ;*              ON ANY GIVEN PASS AND THE LOW BYTE IS THE PATTERN THAT WAS
892                 ;*              WRITTEN BY THE PREVIOUS PASS THROUGH THE RAM.
893                 ;*
894                 ;*      TMP5    DATA READ FROM THE RAM.  ONLY THE LOW BYTE IS USED.
895                 ;*
896                 ;*      TMP6    ----
897                 ;*      TMP7    ----
898                 ;*      TMP8    ----
899                 ;*      TMP9    ----
900                 ;*
901                 ;*      TMPA    RAM ADDRESS BEING TESTED.
902                 ;*
903                 ;*      TMPB    BIT POINTER.  NUMBER OF THE BIT WITHIN THE DATA FIELD WHICH IS
904                 ;*              BEING SWITCHED ON EACH WRITE WITHIN THE CURRENT PASS.
905                 ;*
906                 ;*      TMPC    DATA FLAG.  BIT 0 OF THIS WORD IS THE VALUE TO WHICH THE BIT
907                 ;*              IDENTIFIED IN TMPB IS BEING SET ON EACH WRITE IN THE CURRENT
908                 ;*              PASS.
909                 ;*
910                 ;*      TMPD    DIRECTION SWITCH.  0 = FORWARD    NON-ZERO = BACKWARD
911                 ;*
912                 ;*      TMPE    LAST VALID ADDRESS TO BE TESTED.  (I.E. THE END OF RAM)
913                 ;*
914                 ;*      TMPF    ERROR FLAGS.  BIT 1 SET = THE LAST DETECTED ERROR WAS THE READ
915                 ;*              OF THE PREVIOUS DATA BEFORE WRITING THE NEW DATA.  IF BIT2 IS
916                 ;*              SET, THE READ AFTER WRITE FAILED.  IF EITHER IS SET WHEN AN
917                 ;*              ERROR IS DETECTED, THE SUPERVISOR IS NOT CALL'D AND THEREFOR
918                 ;*              IT'S ERROR COUNTER WILL NOT REFLECT THE ERROR -- INSTEAD, THE
919                 ;*              DATA LINE IS PRINTED.  (UNLESS THE ERROR HANDLER'S DATA LINE
920                 ;*              PRINT COUNT HAS EXCEDED ITS LIMIT -- IN WHICH CASE ITS
921                 ;*              INVOCATION IS IGNORED.)
922                 ;*****************************************************************************
923
924
925                 ;*****************************************************************************
926                 ;*      TEST 11 <VIA REGISTER ADRESSING>
927                 ;*
928                 ;*      VIA == ''6522 VERSATILE INTERFACE ADAPTER''
929                 ;*
930                 ;* A MASTER CLEAR IS PERFORMED, NEXT, TIMER 1 LATCHES
931                 ;* ARE CLEARED BY WRITING 000 INTO VIA REGS 6 & 7
932                 ;* THEN, 377 IS LOADED INTO DATA DIRECTION REGISTERS A, B (DDRA,DDRB) TO
933                 ;* SET THE PORT PINS FOR OUTPUT MODE.
934                 ;* THEN, A DIFFERENT BYTE OF DATA PATTERN C IS WRITTEN INTO EACH VIA
935                 ;* LOCATION, (EXCEPT THE TIMER REGS 4,5,10,11 OCT) AND AFTER EACH IS WRITTEN,
936                 ;* ALL VIA REGS (EXCEPT 4,5,10,11) ARE READ AND COMPARED TO EXPECTED
937                 ;* CONTENTS. NOTE THAT SOME VIA REGS ARE ALTERED BY THE LOADING OF OTHERS,
938                 ;* AND THE PROGRAM TAKES THIS INTO ACCOUNT, IN THE SETTING OF EXPECTED REG
939                 ;* VALUES. THE DATA PATTERN IS CHOSEN TO AVOID ACTIVATING THE VIA CHIP (SUCH
940                 ;* AS GENERATING OUTPUTS ON CA1, CA2, CB1, CB2, OR CAUSING 6502
941                 ;* INTERRUPT REQUESTS).
```

```
942                 ;*  DATA PATTERN C (WITH VIA REGS AND THEIR DATA SHOWN IN OCTAL) :
943                 ;*   REGISTER =  00   01   02   03   06   07   12   13   14   15   16   17
944                 ;*        DATA = 100, 101, 377, 377, 106, 107, 112, 040, 042, 000, 200, 117
945                 ;* NEXT, 000 IS LOADED INTO DDRA, AND DDRB IS READ AND COMPARED TO 377. THEN,
946                 ;* THE 377 IS LOADED BACK INTO DDRA, AND DDRB IS LOADED WITH 000 AND DDRA IS
947                 ;* READ AND COMPARED TO 377.
948                 ;*****************************************************************************
949
950
951                 ;*****************************************************************************
952                 ;*      TEST 12 <VIA'S DDRB DATA READ/WRITE>
953                 ;*
954                 ;*      DDRB == 'DATA DIRECTION REGISTER B''
955                 ;* FIRST, A MASTER CLEAR IS PERFORMED. THEN :
956                 ;* READ/WRITE BITS 0-7 OF VIA DATA DIRECTION REGISTER B ARE TESTED BY WRITING,
957                 ;* READING, AND COMPARING EACH BYTE OF DATA PATTERN B.
958                 ;*   DATA PATTERN B = 125, 252, 000, 377, 001, 002, 004, 010, 020, 040, 100,
959                 ;*                    200, 376, 375, 373, 367, 357, 337, 277, 177, 000
960                 ;*****************************************************************************
961
962
963                 ;*****************************************************************************
964                 ;*      TEST 13 <VIA'S DDRA DATA READ/WRITE>
965                 ;*
966                 ;*      DDRA == 'DATA DIRECTION REGISTER A''
967                 ;*
968                 ;* FIRST, A MASTER CLEAR IS PERFORMED. THEN :
969                 ;* READ/WRITE BITS 0-7 OF VIA DATA DIRECTION REGISTER A ARE TESTED BY WRITING,
970                 ;* READING, AND COMPARING EACH BYTE OF DATA PATTERN B.
971                 ;*   DATA PATTERN B = 125, 252, 000, 377, 001, 002, 004, 010, 020, 040, 100,
972                 ;*                    200, 376, 375, 373, 367, 357, 337, 277, 177, 000
973                 ;*****************************************************************************
974
975
976                 ;*****************************************************************************
977                 ;*      TEST 14 <VIA'S ORB DATA READ/WRITE>
978                 ;*
979                 ;*      ORB == 'OUTPUT REGISTER PORT B''
980                 ;*
981                 ;* FIRST, A MASTER CLEAR IS PERFORMED. NEXT, 377 IS LOADED INTO DATA
982                 ;* DIR. REG. B (DDRB) TO SET ALL B PORT PINS FOR OUTPUT MODE. THEN ,
983                 ;* READ/WRITE BITS 0-7 OF VIA OUTPUT REG. PORT B ARE TESTED BY WRITING,
984                 ;* READING, AND COMPARING EACH BYTE OF DATA PATTERN B.
985                 ;*   DATA PATTERN B = 125, 252, 000, 377, 001, 002, 004, 010, 020, 040, 100,
986                 ;*                    200, 376, 375, 373, 367, 357, 337, 277, 177, 000
987                 ;*****************************************************************************
988
989
990                 ;*****************************************************************************
991                 ;*      TEST 15 <VIA'S T1 DATA READ/WRITE>
992                 ;*
993                 ;*      T1 == 'TIMER #1''
994                 ;*
995                 ;* THIS TEST WRITES, READS, AND CHECKS THE T1 LATCHES AND COUNTER REGISTERS
996                 ;* WITH DATA PATTERNS IN EACH OF 3 SUBTESTS.
997                 ;*
```

```
;*
;* 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
;*********************************************************************************


;*********************************************************************************
;*      TEST 16 <VIA'S SR DATA READ/WRITE>
;*
```

```
1054                    ;*      SR == 'SHIFT REGISTER''
1055                    ;*
1056                    ;* FIRST, A MASTER CLEAR IS PERFORMED AND THE ACR IS SET TO 000. THEN :
1057                    ;* READ/WRITE BITS 0-7 OF VIA SHIFT REGISTER ARE TESTED BY WRITING, READING,
1058                    ;* AND COMPARING EACH BYTE OF DATA PATTERN B.
1059                    ;*   DATA PATTERN B = 125, 252, 000, 377, 001, 002, 004, 010, 020, 040, 100,
1060                    ;*                    200, 376, 375, 373, 367, 357, 337, 277, 177, 000
1061                    ;*****************************************************************************
1062
1063
1064                    ;*****************************************************************************
1065                    ;*      TEST 17 <VIA'S ACR DATA READ/WRITE>
1066                    ;*
1067                    ;*      ACR == ''AUXILIARY CONTROL REGISTER''
1068                    ;*
1069                    ;* FIRST, A MASTER CLEAR IS PERFORMED. THEN :
1070                    ;* READ/WRITE BITS 0-7 OF THE ACR ARE TESTED BY WRITING, READING,
1071                    ;* AND COMPARING EACH BYTE OF DATA PATTERN B.
1072                    ;*   DATA PATTERN B = 125, 252, 000, 377, 001, 002, 004, 010, 020, 040, 100,
1073                    ;*                    200, 376, 375, 373, 367, 357, 337, 277, 177, 000
1074                    ;*****************************************************************************
1075
1076
1077                    ;*****************************************************************************
1078                    ;*      TEST 18 <VIA'S PCR DATA READ/WRITE>
1079                    ;*
1080                    ;*      PCR == 'PERIPHERAL CONTROL REGISTER''
1081                    ;*
1082                    ;* FIRST, A MASTER CLEAR IS PERFORMED. THEN :
1083                    ;* READ/WRITE BITS 0-7 OF THE PCR REGISTER ARE TESTED BY WRITING, READING,
1084                    ;* AND COMPARING EACH BYTE OF A SUBSET OF DATA PATTERN B.
1085                    ;*   DATA PATTERN B (SUBSET) =  125, 252, 000, 377, 001, 002, 004, 010, 020,
1086                    ;*                              040, 100, 200.
1087                    ;*****************************************************************************
1088
1089
1090                    ;*****************************************************************************
1091                    ;*      TEST 19 <VIA'S IER DATA READ/WRITE>
1092                    ;*
1093                    ;*      IER == ''INTERRUPT ENABLE REGISTER''
1094                    ;*
1095                    ;* BITS 0-6 OF THE IER CAN BE SET OR CLEARED ON A WRITE, UNDER CONTROL OF THE
1096                    ;* SET/CLEAR CONTROL BIT 7. TO TEST THIS , EACH BYTE OF DATA PATTERN D IS
1097                    ;* WRITTEN INTO IER, AND THE REGISTER IS READ AND COMPARED TO THE CORRESPOND-
1098                    ;* ING BYTE OF DATA PATTERN E.
1099                    ;*
1100                    ;*   DATA PATTERN D = 200, 201, 202, 204, 210, 220, 240, 300, 200, 000, 001,
1101                    ;*                    002, 004, 010, 020, 040, 100, 000, 325, 125, 252, 052
1102                    ;*
1103                    ;*   DATA PATTERN E = 000, 001, 003, 007, 017, 037, 077, 177, 177, 177, 176,
1104                    ;*                    174, 170, 160, 140, 100, 000, 000, 125, 000, 052, 000
1105                    ;*
1106                    ;*****************************************************************************
1107
1108
1109                    ;*****************************************************************************
```

```
1110                ;*      TEST 20 <VIA'S ORB/DDRB MASTER CLEAR TEST>
1111                ;*
1112                ;*      ORB == 'OUTPUT REGISTER PORT B''
1113                ;*      DDRB == 'DATA DIRECTION REGISTER B''
1114                ;*
1115                ;* FIRST, A MASTER CLEAR IS PERFORMED. NEXT, 377 IS LOADED INTO DDRB TO SET
1116                ;* ALL B PORT PINS FOR OUTPUT MODE. THEN, A 000 BYTE IS WRITTEN INTO ORB AND
1117                ;* THE REGISTER IS READ BACK AND CHECKED FOR 000. THEN, A MASTER CLEAR IS
1118                ;* PERFORMED AND ORB IS READ AND CHECKED FOR 377.
1119                ;*****************************************************************************
1120
1121
1122                ;*****************************************************************************
1123                ;*      TEST 21 <VIA'S DDRB MASTER CLEAR TEST>
1124                ;*
1125                ;*      DDRB == 'DATA DIRECTION REGISTER B''
1126                ;*
1127                ;* A 377 BYTE IS WRITTEN INTO DDRB AND THE REGISTER IS READ BACK AND CHECKED
1128                ;* FOR 377. THEN, A MASTER CLEAR IS PERFORMED AND DDRB IS READ AND CHECKED FOR
1129                ;* 000.
1130                ;*
1131                ;* NOTE:  THIS TESTING IS ALSO DONE IN TEST 23.  IT IS INCLUDED HERE ONLY TO
1132                ;*        PROVIDE TIGHTER LOOPING ON JUST THE DDRB MASTER CLEAR CHECKING.
1133                ;*****************************************************************************
1134
1135
1136                ;*****************************************************************************
1137                ;*      TEST 22 <VIA'S DDRA MASTER CLEAR TEST>
1138                ;*
1139                ;*      DDRA == 'DATA DIRECTION REGISTER A''
1140                ;*
1141                ;* A 377 BYTE IS WRITTEN INTO DDRA AND THE REGISTER IS READ BACK AND CHECKED
1142                ;* FOR 377. THEN, A MASTER CLEAR IS PERFORMED AND DDRA IS READ AND CHECKED FOR
1143                ;* 000.
1144                ;*****************************************************************************
1145
1146
1147                ;*****************************************************************************
1148                ;*      TEST 23 <VIA'S SR MASTER CLEAR TEST>
1149                ;*
1150                ;*      SR == 'SHIFT REGISTER''
1151                ;*
1152                ;* A 123 BYTE IS WRITTEN INTO SR AND THE REGISTER IS READ BACK AND CHECKED
1153                ;* FOR 123. THEN, A MASTER CLEAR IS PERFORMED AND SR IS READ AND CHECKED FOR
1154                ;* NO CHANGE.
1155                ;*****************************************************************************
1156
1157
1158                ;*****************************************************************************
1159                ;*      TEST 24 <VIA'S ACR MASTER CLEAR TEST>
1160                ;*
1161                ;*      ACR == 'AUXILIARY CONTROL REGISTER''
1162                ;*
1163                ;* A 252 BYTE IS WRITTEN INTO ACR AND THE REGISTER IS READ BACK AND CHECKED
1164                ;* FOR 252. THEN, A MASTER CLEAR IS PERFORMED AND ACR IS READ AND C   CKED FOR
1165                ;* 000, TO VERIFY THAT IT IS CLEARED BY MASTER CLEAR.
```

```
1166                ;*****************************************************************************
1167
1168
1169                ;*****************************************************************************
1170                ;*      TEST 25 <VIA'S PCR MASTER CLEAR TEST>
1171                ;*
1172                ;*      PCR == 'PERIPHERAL CONTROL REGISTER''
1173                ;*
1174                ;* A 377 BYTE IS WRITTEN INTO PCR AND THE REGISTER IS READ BACK AND CHECKED
1175                ;* FOR 377. THEN, A MASTER CLEAR IS PERFORMED AND PCR IS READ AND CHECKED FOR
1176                ;* 000.
1177                ;*****************************************************************************
1178
1179
1180                ;*****************************************************************************
1181                ;*      TEST 26 <VIA'S IER MASTER CLEAR TEST>
1182                ;*
1183                ;*      IER == ''INTERRUPT ENABLE REGISTER''
1184                ;*
1185                ;* A 377 BYTE IS WRITTEN INTO IER AND THE REGISTER IS READ BACK AND CHECKED
1186                ;* FOR 377. THEN, A MASTER CLEAR IS PERFORMED AND IER IS READ AND CHECKED FOR
1187                ;* 200.
1188                ;*****************************************************************************
1189
```

8.0 ERROR INFORMATION

8.1 ERROR REPORTING

ERRORS ARE REPORTED BY THE PROGRAM AS THEY OCCUR (IF NOT INHIBITED). THE REPORT CONFORMS TO THE DIAGNOSTIC SUPERVISOR ERROR REPORT FORMAT, AND CONSISTS OF A DESCRIPTION OF THE ERROR, THE TEST NUMBER, SUBTEST NUMBER, PC OF THE ERROR CALL, DEVICE ADDRESS, AND BASIC AND EXTENDED ERROR INFORMATION.

THE FOLLOWING EXAMPLE PROVIDES A TYPICAL ERROR REPORT, WHICH DESCRIBES A "MASTER CLEAR FAILURE" ERROR, AND PROVIDES THE PC OF THE ERROR CALL AND THE DEVICE REGISTER CONTENTS :

```
  CVDMA DVC FTL ERR 00001 ON UNIT 00 TST 002 SUB 000 PC: 021122
  MASTER CLEAR FAILURE

    THE CONTENTS OF ALL BYTE SELECT REG'S ARE:
  BSEL0   BSEL1   BSEL2   BSEL3
   000     000     000     000
     BSEL4   BSEL5   BSEL6   BSEL7
      000     000     121     000
  BSEL10  BSEL11  BSEL12  BSEL13
   000     000     000     000
     BSEL14  BSEL15  BSEL16  BSEL17
      000     000     000     000
```

FOR OTHER ERRORS, THE REPORT MAY BE MORE EXTENSIVE, AND REQUIRE ADDITIONAL DATA TO BE REPORTED.

IF EXTENDED ERROR INFORMATION HAD BEEN INHIBITED USING THE IXE FLAG PRIOR TO RUNNING THE TEST, THE ABOVE ERROR WOULD HAVE BEEN REPORTED IN THE FOLLOWING SHORTENED FORM :

```
  CVDMA DVC FTL ERR 00001 ON UNIT 00 TST 002 SUB 000 PC: 021122
  MASTER CLEAR FAILURE
```

^

```
                                .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
```

```
1261                    .SBTTL PROGRAM HEADER
1262                    ;++
1263                    ;THE PROGRAM HEADER MACRO CHARACTERIZES THIS DIAGNOSTIC. THE
1264                    ;HEADER MACRO'S ARGUMENTS ARE FILE NAME, RELEASE LEVEL, PATCH
1265                    ;DISPOSITION OF THE MOST RECENT PATCH, MAXIMUM TEST TIME IN SEC.,
1266                    ;AND THE TYPE OF DIAGNOSTIC (0-SEQUENTIAL, 1-EXERCISER).  THESE
1267                    ;ARGUMENTS ARE IN RESPECTIVE ORDER.
1268                    ;--
1269
1270   002000           HEADER CVDMA,A,0,110.,0
1271   002000
1272   002000   103                                    L$NAME::
1273   002001   126                                            .ASCII /C/
1274   002002   104                                            .ASCII /V/
1275   002003   115                                            .ASCII /D/
1276   002004   101                                            .ASCII /M/
1277   002005   000                                            .ASCII /A/
1278   002006   000                                            .BYTE   0
1279   002007   000                                            .BYTE   0
1280   002010                                                  .BYTE   0
1281   002010   101                                    L$REV::
1282   002011                                                  .ASCII  /A/
1283   002011   060                                    L$DEPO::
1284   002012                                                  .ASCII  /0/
1285   002012   000000                                 L$UNIT::
1286   002014                                                  .WORD   0
1287   002014   000156                                 L$TIML::
1288   002016                                                  .WORD   110.
1289   002016   040066                                 L$HPCP::
1290   002020                                                  .WORD   L$HARD
1291   002020   000000                                 L$SPCP::
1292   002022                                                  .WORD   0
1293   002022   002216                                 L$HPTP::
1294   002024                                                  .WORD   L$HW
1295   002024   000000                                 L$SPTP::
1296   002026                                                  .WORD   0
1297   002026   040344                                 L$LADP::
1298   002030                                                  .WORD   L$LAST
1299   002030   000000                                 L$STA::
1300   002032                                                  .WORD   0
1301   002032   000000                                 L$CO::
1302   002034                                                  .WORD   0
1303   002034   000000                                 L$DTYP::
1304   002036                                                  .WORD   0
1305   002036   000000                                 L$APT::
1306   002040                                                  .WORD   0
1307   002040   002124                                 L$DTP::
1308   002042                                                  .WORD   L$DISPATCH
1309   002042   000000                                 L$PRIO::
1310   002044                                                  .WORD   0
1311   002044   000000                                 L$ENVI::
1312   002046                                                  .WORD   0
1313   002046   000000                                 L$EXP1::
1314   002050                                                  .WORD   0
1315   002050   003                                    L$MREV::
1316   002051   003                                            .BYTE   C$REVISION
                                                               .BYTE   C$EDIT
```

```
1317  002052
1318  002052  000000
1319  002054  000000
1320  002056
1321  002056  000000
1322  002060
1323  002060  003522
1324  002062
1325  002062  000000
1326  002054
1327  002064  000000
1328  002066
1329  002066  000000
1330  002070
1331  002070  020352
1332  002072
1333  002072  020346
1334  002074
1335  002074  000000
1336  002076
1337  002076  003542
1338  002100
1339  002100  104035
1340  002102
1341  002102  002236
1342  002104
1343  002104  017622
1344  002106
1345  002106  020330
1346  002110
1347  002110  020204
1348  002112
1349  002112  017614
1350  002114
1351  002114  000000
1352  002116
1353  002116  000000
1354  002120
1355  002120  000000
1356
1357                            .EVEN
```

```
LSEF::
        .WORD   0
        .WORD   0
LSSPC::
        .WORD   0
LSDEVP::
        .WORD   LSDVTYP
LSREPP::
        .WORD   0
LSEXP4::
        .WORD   0
LSEXP5::
        .WORD   0
LSAUT::
        .WORD   LSAU
LSDUT::
        .WORD   LSDU
LSLUN::
        .WORD   0
LSDESP::
        .WORD   LSDESC
LSLOAD::
        FMT     ESLOAD
LSETP::
        .WORD   LSERRTBL
LSICP::
        .WORD   ESINIT
LSCCP::
        .WORD   LSCLEAN
LSACP::
        .WORD   LSAUTO
LSPRT::
        .WORD   LSPROT
LSTEST::
        .WORD   0
LSDLY::
        .WORD   0
LSHIME::
        .WORD   0
```

```
1358                            .SBTTL DISPATCH TABLE
1359
1360                            ;//////////////////////////////////////////////////////////////////////////
1361                            ;/ THE DISPATCH TABLE CONTAINS THE STARTING ADDRESS OF EACH TEST.
1362                            ;/ IT IS USED BY THE SUPERVISOR TO DISPATCH TO EACH TEST.
1363                            ;//////////////////////////////////////////////////////////////////////////
1364
1365  002122                            DISPATCH        28.
1366  002122  000034                                                   .WORD   28
1367  002124                                                  L$DISPATCH::
1368  002124  020354                                                   .WORD   T1
1369  002126  021120                                                   .WORD   T2
1370  002130  021230                                                   .WORD   T3
1371  002132  021422                                                   .WORD   T4
1372  002134  021564                                                   .WORD   T5
1373  002136  021706                                                   .WORD   T6
1374  002140  022110                                                   .WORD   T7
1375  002142  022620                                                   .WORD   T8
1376  002144  023166                                                   .WORD   T9
1377  002146  024134                                                   .WORD   T10
1378  002150  025114                                                   .WORD   T11
1379  002152  025736                                                   .WORD   T12
1380  002154  026020                                                   .WORD   T13
1381  002156  026102                                                   .WORD   T14
1382  002160  026204                                                   .WORD   T15
1383  002162  027250                                                   .WORD   T16
1384  002164  027332                                                   .WORD   T17
1385  002166  027414                                                   .WORD   T18
1386  002170  027500                                                   .WORD   T19
1387  002172  027566                                                   .WORD   T20
1388  002174  030054                                                   .WORD   T21
1389  002176  030204                                                   .WORD   T22
1390  002200  030334                                                   .WORD   T23
1391  002202  030470                                                   .WORD   T24
1392  002204  030620                                                   .WORD   T25
1393  002206  030750                                                   .WORD   T26
1394  002210  031106                                                   .WORD   T27
1395  002212  036332                                                   .WORD   T28
1396
```

```
                        .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:
```

```
1429                                    .SBTTL SOFTWARE P-TABLE
1430
1431                                    ;////////////////////////////////////////////////////////////////////////
1432                                    ;/ THE SOFTWARE P-TABLE CONTAINS THE VALUES OF THE PROGRAM
1433                                    ;/ PARAMETERS THAT CAN BE CHANGED BY THE OPERATOR.
1434                                    ;////////////////////////////////////////////////////////////////////////
1435
1436  002234                                    BGNSW   SFPTBL
1437  002234  000000                                                       .WORD   L10001-L$SW/2
1438  002236                                                          L$SW::
1439  002236                                                          SFPTBL::
1440  002236                                    ENDSW
1441  002236                                                          L10001:
```

```
                                .SBTTL GLOBAL EQUATES SECTION


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

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
                ;
000040          EF.START==      32.                     ; START COMMAND WAS ISSUED
000037          EF.RESTART==    31.                     ; RESTART COMMAND WAS ISSUED
000036          EF.CONTINUE==   30.                     ; CONTINUE COMMAND WAS ISSUED
000035          EF.NEW==        29.                     ; A NEW PASS HAS BEEN STARTED
000034          EF.PWR==        28.                     ; A POWER-FAIL/POWER-UP OCCURRED
                ;
                ;
                ; PRIORITY LEVEL DEFINITIONS
                ;
000340          PRI07== 340
000300          PRI06== 300
000240          PRI05== 240
000200          PRI04== 200
```

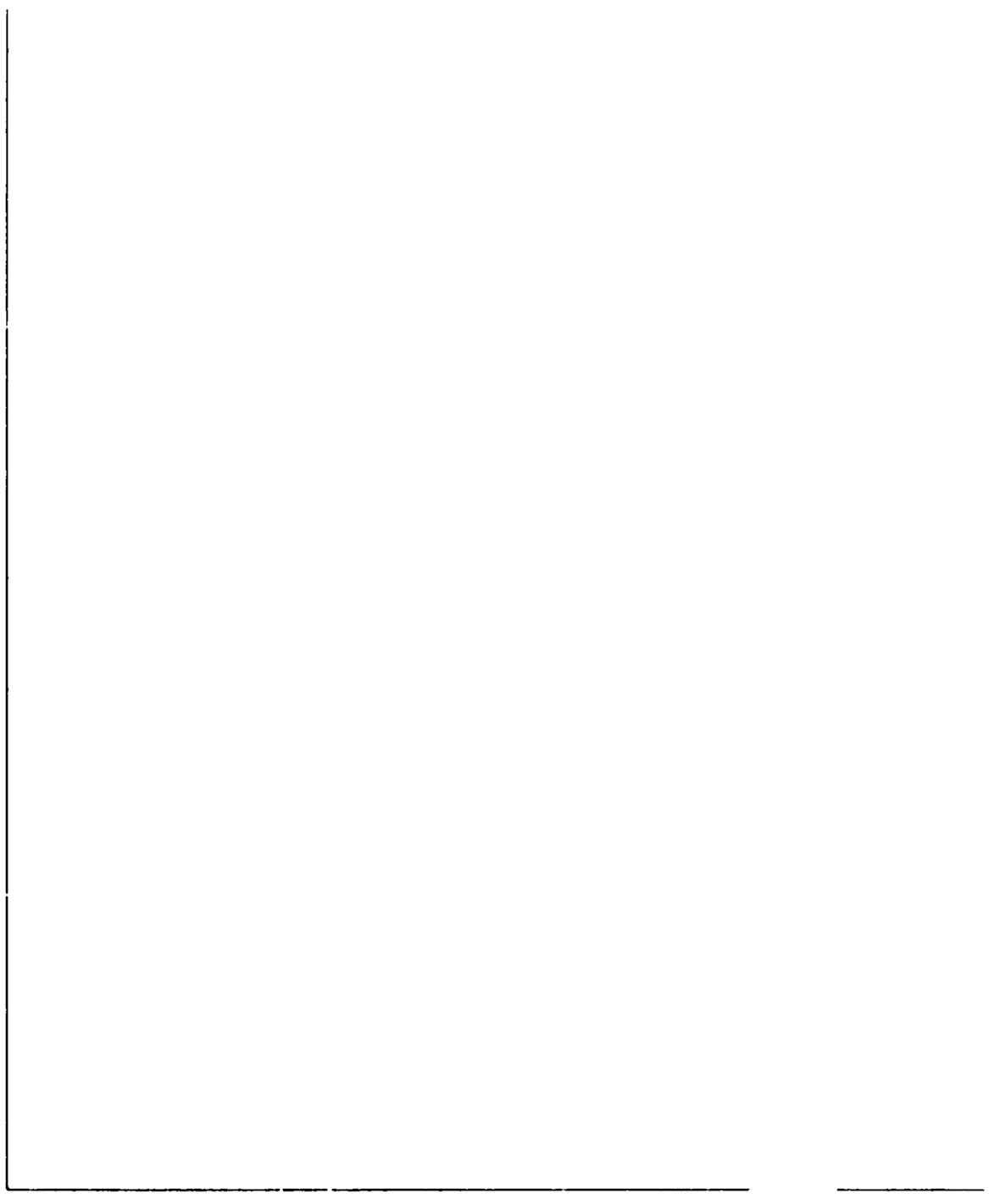
```
1498    000140          PRI03== 140
1499    000100          PRI02== 100
1500    000040          PRI01== 40
1501    000000          PRI00== 0
1502                    ;
1503                    ;OPERATOR FLAG BITS
1504                    ;
1505    000004          EVL==       4
1506    000010          LOT==      10
1507    000020          ADR==      20
1508    000040          IDU==      40
1509    000100          ISR==     100
1510    000200          UAM==     200
1511    000400          BOE==     400
1512    001000          PNT==    1000
1513    002000          PRI==    2000
1514    004000          IXE==    4000
1515    010000          IBE==   10000
1516    020000          IER==   20000
1517    040000          LOE==   40000
1518    100000          HOE==  100000
1519
1520                    .SBTTL  DEFINE THE NUMBER OF CSR'S
1521    000020          CSREGS  =  16.
1522
1523                    ;-----------------------------------------------------------------------
1524
1525                    .SBTTL  NPR ADDRESS REGISTER EQUATES
1526    000070          NPRAOL  = 70                    ;OUT NPR ADRS LO REG
1527    000071          NPRAOH  = NPRAOL+1              ;OUT NPR ADRS HI REG
1528    000072          NPRAOX  = NPRAOL+2              ;OUT NPR EXTENDED ADRS REG
1529    000074          NPRAIL  = NPRAOL+4              ;IN NPR ADRS LO REG
1530    000075          NPRAIH  = NPRAOL+5              ;IN NPR ADRS HI REG
1531    000076          NPRAIX  = NPRAOL+6              ;IN NPR EXTENDED ADRS REG
1532    000010          NPRBS7  = BIT3                  ;'BANK SELECT 7'' BIT -- W/IN EXTENDED ADRS. REG.
1533
1534
1535
1536                    .SBTTL  NPR DATA REG EQUATES
1537    123000          NPRDRL  = 123000                ;NPR DATA REGISTER -- LOW BYTE
1538    123001          NPRDRH  = NPRDRL+1              ;NPR DATA REGISTER -- HIGH BYTE
1539
1540
1541
1542                    .SBTTL  NPR CONTROL REG EQUATES
1543    123004          NPRCTL  = NPRDRL+4              ;NPR CONTROL REGISTER
1544    000200          NPRABT  = BIT7                  ;=1 IF BUS TIME-OUT ON NPR
1545    000100          NPRGO   = BIT6                  ;SET FOR NOP, CLEAR TO 'GO' / 0=DONE, 1=BUSY
1546    000040          NPRIO   = BIT5                  ;0 = (LSI ==> DMV);  1 = (DMV ==> LSI)
1547    000020          LSIHLT  = BIT4                  ;SETTING THIS WILL 'HALT'' THE LSI-11 !!
1548    000010          NPRBYT  = BIT3                  ;SET TO 1 TO WRITE BYTE ONLY TO LSI-11
1549    000004          DMVPU   = BIT2                  ;SET BY MICRO-DIAG.  MUST REMAIN SET!!!
1550    000002          LSIDCL  = BIT1                  ;IF SET, WILL CAUSE POWER DOWN CONDITION IN LSI!
1551    000001          DMVDAI  = BIT0                  ;'DISABLE INIT'' FROM EFFECTING DMV-11
1552
1553
```

```
CVDMAA.P11    12-DEC-80 15:59        NPR REQUEST FUNCTIONS

  1554                               .SBTTL  NPR REQUEST FUNCTIONS
  1555          000004               NPRLD   = DMVPU                 ;WORD XFER:  LSI ==> DMV
  1556          000044               NPRDL   = DMVPU!NPRIO           ;WORD XFER:  DMV ==> LSI
  1557          000054               NPRDLB  = DMVPU!NPRIO.NPRBYT    ;BYTE XFER:  DMV ==> LSI
  1558
  1559                               ;-----------------------------------------------------------------------------
  1560
  1561                               .SBTTL  INTERRUPT REG EQUATES
  1562          123005               IRQREG  = 123005                ;INTERRUPT REQUEST REG
  1563          000004               IRQA    = BIT2                  ;REQUEST BIT FOR XX0 INTERRUPT -- "A"
  1564          000002               IRQB    = BIT1                  ;REQUEST BIT FOR XX4 INTERRUPT -- "B"
  1565
  1566                               ;-----------------------------------------------------------------------------
  1567
  1568                               .SBTTL  CONTROL FLAGS FROM P-TABLE ENTRIES
  1569          000001               PU24    = BIT0                  ;POWER-FAIL VECTORING MODE.  1 = MODE 0
  1570                                                               ;  (I.E. JUMPERS W5 & W6 BOTH REMOVED)
```

```
CVDMAA.P11    12-DEC-80 15:59          SWITCH PACKS

 1571                                  .SBTTL  SWITCH PACKS
 1572
 1573                                  ;;*****************************************************************************
 1574                                  ;* SWITCH PACKS
 1575                                  ;;*****************************************************************************
 1576
 1577          121000                  SWPBOT  = 121000                ;'BOOT ADDRESS' SWITCH PACK [A200]
 1578          121400                  SWPDDCMP = 121400               ;'DDCMP ADDRESS' SWITCH PACK [A300]
 1579
```

```
1580                            .SBTTL  CSR REG. DEFINITION FOR MAINT. LOOP
1581
1582                            ;++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
1583                            .SBTTL          MAINTENANCE REGISTER - BSEL0
1584                            ;--------------------------------------------------------------------------------------------
1585                            ;       INTERRUPT ENABLE BITS
1586
1587     000001                 IENBA   = BIT0                    ;INTERRUPT ENABLE 'A'
1588     000020                 IENBB   = BIT4                    ;INTERRUPT ENABLE 'B'
1589
1590
1591                            ;++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
1592                            .SBTTL          MAINTENANCE REGISTER - BSEL1
1593                            ;--------------------------------------------------------------------------------------------
1594                            ; MAINT. LOOP CONTROL BITS:
1595
1596     000200                 RUN     = BIT7
1597     000100                 MCLR    = BIT6
1598     000001                 MREQ    = BIT0
1599
1600
1601                            ;++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
1602                            .SBTTL          MAINTENANCE REGISTER - BSEL2
1603                            ;--------------------------------------------------------------------------------------------
1604                            ; MAINTENANCE FUNCTION CODES
1605
1606     000001                 REDLOC  = 1                       ;FUNCTION CODE FOR READ A 6502 LOCATION
1607     000002                 WRILOC  = 2                       ;FUNCTION CODE FOR WRITE A 6502 LOCATION
1608     000003                 REDPAG  = 3                       ;FUNCTION CODE FOR READ A 6502 MEMORY PAGE
1609     000004                 WRIPAG  = 4                       ;FUNCTION CODE FOR WRITE A 6502 RAM PAGE
1610     000005                 EXECUT  = 5                       ;FUNCTION CODE FOR EXECUTE AT GIVEN PC
1611
1612     000200                 MRDY    = BIT7                    ;M-LOOP REDY FOR A COMMAND WHEN SET
```

```
1613                                    .SBTTL  DMV INTERNAL ADDRESSES
1614
1615                                    ;++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
1616                                    ;                       DMV INTERNAL ADDRESSES
1617                                    ;--++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
1618
1619
1620                                    ;#########  <<  MICROPROCESSOR REGISTER ADDRESS EQUATES  >> ##########
1621
1622                                    .SBTTL          BYTE & WORD SELECT REGISTERS
1623
1624            000020                  SLT0    =020
1625            000020                  BSLT0   =SLT0
1626            000021                  BSLT1   =SLT0+1
1627            000022                  SLT2    =SLT0+2
1628            000022                  BSLT2   =SLT0+2
1629            000023                  BSLT3   =SLT0+3
1630            000024                  SLT4    =SLT0+4
1631            000024                  BSLT4   =SLT0+4
1632            000025                  BSLT5   =SLT0+5
1633            000026                  SLT6    =SLT0+6
1634            000026                  BSLT6   =SLT0+6
1635            000027                  BSLT7   =SLT0+7
1636
1637                                    .SBTTL          VIA'S REGISTERS
1638
1639            120000                  ORB     =120000
1640            120001                  ORA     =ORB+1
1641            120002                  DDRB    =ORB+2
1642            120003                  DDRA    =ORB+3
1643            120004                  T1CL    =ORB+4
1644            120005                  T1CH    =ORB+5
1645            120005                  T1LHGO  =ORB+5
1646            120006                  T1LL    =ORB+6
1647            120007                  T1LH    =ORB+7
1648            120010                  T2LL    =ORB+10
1649            120010                  T2CL    =T2LL
1650            120011                  T2CH    =ORB+11
1651            120012                  SR      =ORB+12
1652            120013                  ACR     =ORB+13
1653            120014                  PCR     =ORB+14
1654            120015                  IFR     =ORB+15
1655            120016                  IENR    =ORB+16
1656            120017                  ORAM    =ORB+17
1657
1658                                    .SBTTL          VIA'S ''IFR'' REGISTER'S BIT ASSIGNMENTS
1659
1660            000200                  IFRIRQ  =BIT7   ;''IRQ'' HAS BEEN ISSUED -- LOGICAL ''OR'' OF BITS 0 --> 6
1661            000100                  IFRT1   =BIT6   ;''T1'' -- TIMER # 1 TIMED-OUT
1662            000040                  IFRT2   =BIT5   ;''T2'' -- TIMER # 1 TIMED-OUT
1663            000020                  IFRCB1  =BIT4   ;''CB1'' EDGE DETECTED (''K2 LINE UNIT STEP'' O/P SIGNAL FROM SR)
1664            000010                  IFRCB2  =BIT3   ;''CB2'' EDGE DETECTED (UNUSED!)
1665            000004                  IFRSR   =BIT2   ;''SR'' REGISTER COMPLETED SHIFT OPERATION
1666            000002                  IFRCA1  =BIT1   ;''CA1'' EDGE DETECTED (''K6 MOD RDY H'')
1667            000001                  IFRCA2  =BIT0   ;''CA2'' EDGE DETECTED (''K2 CTS H'')
1668
```



```
1670
1671                            .SBTTL GLOBAL DATA SECTION
1672
1673                            ;////////////////////////////////////////////////////////////////////////////////
1674                            ;/      THE GLOBAL DATA SECTION CONTAINS DATA THAT ARE USED
1675                            ;/      IN MORE THAN ONE TEST.
1676                            ;////////////////////////////////////////////////////////////////////////////////
1677
1678                            ;++*************************************************************************
1679                            .SBTTL  CONTROL BLOCK FOR STACKED ERROR MESSAGES
1680                            ;--*************************************************************************
1681  002236                            ERRTBL
1682  002236                                                                  LSERRTBL::
1683  002236  000000            ERRTYP::        .WORD   0
1684  002240  000000            ERRNBR::        .WORD   0
1685  002242  000000            ERRMSG::        .WORD   0
1686  002244  000000            ERRBLK::        .WORD   0
1687
1688                            ;++*************************************************************************
1689                            .SBTTL  STORAGE FOR DEVICE REGISTERS
1690                            ;--*************************************************************************
1691  002246                    WSR0:
1692  002246  000000            BSR0:   .WORD   0
1693  002250                    WSR2:
1694  002250  000000            BSR1:   .WORD   0
1695  002252                    WSR4:
1696  002252  000000            BSR2:   .WORD   0
1697  002254                    WSR6:
1698  002254  000000            BSR3:   .WORD   0
1699  002256                    WSR10:
1700  002256  000000            BSR4:   .WORD   0
1701  002260                    WSR12:
1702  002260  000000            BSR5:   .WORD   0
1703  002262                    WSR14:
1704  002262  000000            BSR6:   .WORD   0
1705  002264                    WSR16:
1706  002264  000000            BSR7:   .WORD   0
1707  002266  000000            BSR10:  .WORD   0
1708  002270  000000            BSR11:  .WORD   0
1709  002272  000000            BSR12:  .WORD   0
1710  002274  000000            BSR13:  .WORD   0
1711  002276  000000            BSR14:  .WORD   0
1712  002300  000000            BSR15:  .WORD   0
1713  002302  000000            BSR16:  .WORD   0
1714  002304  000000            BSR17:  .WORD   0
1715
1716                            ;++*************************************************************************
1717                            .SBTTL  MISCELLANEOUS STORAGE
1718                            ;--*************************************************************************
1719  002306  000000            TDATA:  .WORD   0               ;TEST DATA
1720  002310  000000            GDATA:  .WORD   0               ;EXPECTED DATA
1721  002312  000000            BDATA:  .WORD   0               ;ACTUAL DATA
1722  002314  000000            XDATA:  .WORD   0               ;EXCLUSIVE OR BETWEEN 'GDATA' & 'BDATA'
1723  002316  110400            DELAY1: .WORD   110400          ;DELAY TIME, 3 INST., 500 MILLISEC.
1724  002320  000007            DELAY2: .WORD   7               ;DELAY TIME FOR M-LOOP FUNCTION, 100 USEC.APPROX.
1725  002322  000000            LOGDEV: .WORD   0               ;LOGICAL DEVICE NUMBER
```

```
1726  002324  000000  PSTACK: .WORD   0               ;CONTAINS BASE LEVEL PROGRAM STACK POINTER
1727  002326  000000  INTFLG: .WORD   0               ;INTERRUPT RECEIVED FLAG BYTES.  ALLOCATION:
1728                                                  ;  LOW BYTE FOR "A" & HIGH BYTE FOR "B"
1729  002330  000000  INTWCH: .WORD   0               ;BYTE IS SET NON-ZERO WHEN HANDLER SHOULD BE
1730                                                  ;  WATCHING FOR INT'S.  ALLOCATION: SEE INTFLG
1731  002332  000000  ERRFLG: .WORD   0               ;ERROR FLAG
1732  002334  000000  REGNUM: .WORD   0               ;REGISTER NUMBER -- FOR PASSING ARG. TO 'ERRA'
1733  002336  000000  FRSTIM: .WORD   0               ;FLAG=0 IF PROGRAM JUST LOADED
1734  002340  000000  FRSPAS: .WORD   0               ;FLAG=0 IF FIRST PASS AFTER LOAD
1735  002342  000000  DEVMAP: .WORD   0               ;BIT MAP OF ACTIVE DEVICES
1736  002344  000000  DEVPTR: .WORD   0               ;DEVICE MAP BIT POINTER
1737  002346  000000  CONSOL: .WORD   0               ;CONSOLE DEVICE FLAG -- NON-ZERO = NONE PRESENT
1738  002350  000000  PFLAG:  .WORD   0               ;MISC. PROGRAM FLAGS
1739
1740                        ;  THE ABOVE WORD CONTAINS MISC. FLAGS WHICH CAN ONLY BE ACCESSED BY PATCHING.
1741                        ;  IT IS NOT INTENDED THAT THEY BE SET OR CLEARED EXCEPT UNDER VERY UNUSUAL
1742                        ;  CIRCUMSTANCES.  THEREFORE, THEY WILL NOT BE DOCUMENTED ANY OTHER PLACE
1743                        ;  EXCEPT RIGHT HERE.
1744                        ;
1745                        ;  BIT 0 -- WHEN SET, THOSE TESTS WHICH DO A BUS RESET WILL NOT BE EXECUTED.
1746                        ;           THIS WAS IMPLEMENTED TO SAVE WEAR & TEAR ON THE RX01 IN THE
1747                        ;           DEVELOPMENT SYSTEM WHILE DOING LONG TERM TESTING OF ALL OTHER
1748                        ;           TESTS.
1749                        ;
1750                        ;  BIT 1 -- CPU TYPE. (NOT USED)
1751                        ;
1752                        ;  BIT 2 -- CONTROLS PRINTING OF EXTENDED ERROR INFORMATION DURING 'MOVING
1753                        ;           INVERSIONS TEST" OF RAM.  NORMALLY ONLY ADDRESS, GOOD & BAD
1754                        ;           DATA, AND XOR WILL BE PRINTED.  IF THIS BIT IS SET HOWEVER,
1755                        ;           INFORMATION IDENTIFYING WHERE WITHIN THE ALGORITHM THE ERROR
1756                        ;           WAS DETECTED IS REPORTED.  THE FOLLOWING ABBREVIATIONS ARE USED
1757                        ;           IN THE HEADING:
1758                        ;                 BIT --- IDENTIFIES THE INNERMOST LOOP.  WHICH BIT IS
1759                        ;                         BEING INVERTED AT EACH LOCATION.  BITS ARE
1760                        ;                         IDENTIFIED AS 0 THROUGH 7.
1761                        ;                 DATA -- IDENTIFIES THE VALUE TO WHICH THE ABOVE BIT IS
1762                        ;                         BEING SET (I.E. 0 OR 1).  IT IS FIRST READ AND
1763                        ;                         CHECKED FOR EXPECTED CONTENTS; THEN THE BIT IS
1764                        ;                         INVERTED TO THIS STATE (DATA) AND RE-WRITTEN;
1765                        ;                         THEN IT IS AGAIN READ & CHECKED FOR THE NEW
1766                        ;                         VALUE.
1767                        ;                 SEQ --- INDICATES THE DIRECTION (FWD OR BKWD) THE TEST
1768                        ;                         WAS SCANING THROUGH RAM WHEN THE ERROR OCCURED.
1769                        ;                 LSB --- THIS IS THE LOGICAL LEAST SIGNIFICANT BIT OF THE
1770                        ;                         RAM ADDRESS AS WE SCAN THROUGH MEMORY.  BY
1771                        ;                         VARYING THIS, THE ALGORITHM GENERATS NON-SEQUEN-
1772                        ;                         TIAL ADDRESSING OF RAM AND EFFECTS A MUCH MORE
1773                        ;                         THOROUGH TEST OF MEMORY.
1774
1775
1776
```

```
                                .SBTTL  CURRENT DEVICE PARAMETERS

                160000          $MPCSR  ==      160000          ;INITIAL ASSEMPLED IN CSR ADDRESS

        002352                  MPCSR:                          ;POINTER TO THE DMV11 CSR'S
        002352                  BSEL0:                          ;POINTER TO BSEL0
        002352                  BSEL:                           ;ALTERNATE NAME FOR BSEL0
        002352  160000          SEL0:   .WORD   $MPCSR          ;POINTER TO SEL0
        002354  160001          BSEL1:  .WORD   $MPCSR+1        ;POINTER TO BSEL1
        002356                  BSEL2:                          ;POINTER TO BSEL2
        002356  160002          SEL2:   .WORD   $MPCSR+2        ;POINTER TO SEL2
        002360  160003          BSEL3:  .WORD   $MPCSR+3        ;POINTER TO BSEL3
        002362                  BSEL4:                          ;POINTER TO BSEL4
        002362  160004          SEL4:   .WORD   $MPCSR+4        ;POINTER TO SEL4
        002364  160005          BSEL5:  .WORD   $MPCSR+5        ;POINTER TO BSEL5
        002366                  BSEL6:                          ;POINTER TO BSEL6
        002366  160006          SEL6:   .WORD   $MPCSR+6        ;POINTER TO SEL6
        002370  160007          BSEL7:  .WORD   $MPCSR+7        ;POINTER TO BSEL7
        002372                  BSEL10:                         ;POINTER TO BSEL10
        002372  160010          SEL10:  .WORD   $MPCSR+10       ;POINTER TO SEL10
        002374  160011          BSEL11: .WORD   $MPCSR+11       ;POINTER TO BSEL11
        002376                  BSEL12:                         ;POINTER TO BSEL12
        002376  160012          SEL12:  .WORD   $MPCSR+12       ;POINTER TO SEL12
        002400  160013          BSEL13: .WORD   $MPCSR+13       ;POINTER TO BSEL13
        002402                  BSEL14:                         ;POINTER TO BSEL14
        002402  160014          SEL14:  .WORD   $MPCSR+14       ;POINTER TO SEL14
        002404  160015          BSEL15: .WORD   $MPCSR+15       ;POINTER TO BSEL15
        002406                  BSEL16:                         ;POINTER TO BSEL16
        002406  160016          SEL16:  .WORD   $MPCSR+16       ;POINTER TO SEL16
        002410  160017          BSEL17: .WORD   $MPCSR+17       ;POINTER TO BSEL17

        002412  000300          MPIVEC: .WORD      300          ;DMV11 INPUT INTERRUPT VECTOR
        002414  000304          MPOVEC: .WORD      304          ;DMV11 OUTPUT INTERRUPT VECTOR
        002416  000340          MPRIOR: .WORD      340          ;DMV11 DEVICE PRIORITY

                                .SBTTL  GEN'L PURPOSE SCRATCH STORAGE

        002420  000000          REG0:   .WORD   0
        002422  000000          REG1:   .WORD   0
        002424  000000          REG2:   .WORD   0
        002426  000000          REG3:   .WORD   0
        002430  000000          REG4:   .WORD   0
        002432  000000          REG5:   .WORD   0
        002434  000000          REG6:   .WORD   0
        002436  000000          REG7:   .WORD   0
```

```
1823                            .SBTTL  SCRATCH STORAGE FOR MESSAGE REPORTING
1824
1825  002440  000000            TMP0:   .WORD   0
1826  002442  000000            TMP1:   .WORD   0
1827  002444  000000            TMP2:   .WORD   0
1828  002446  000000            TMP3:   .WORD   0
1829  002450  000000            TMP4:   .WORD   0
1830  002452  000000            TMP5:   .WORD   0
1831  002454  000000            TMP6:   .WORD   0
1832  002456  000000            TMP7:   .WORD   0
1833  002460  000000            TMP8:   .WORD   0
1834  002462  000000            TMP9:   .WORD   0
1835  002464  000000            TMPA:   .WORD   0
1836  002466  000000            TMPB:   .WORD   0
1837  002470  000000            TMPC:   .WORD   0
1838  002472  000000            TMPD:   .WORD   0
1839  002474  000000            TMPE:   .WORD   0
1840  002476  000000            TMPF:   .WORD   0
1841  002500  000000            NEWPC:  .WORD   0       ;SAVE LOCATION FOR A 'PC' VALUE RESET
1842  002502  000000            OLDSP:  .WORD   0       ;SAVE LOCATION FOR A STACK POINTER RESET VALUE
1843
1844
```

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

                                        .SBTTL  ***** DATA PATTERN A *****

                                        .EVEN                           ;USAGE:
1845                                    PATA:   .WORD   PATB-PATA-2     ;# OF BYTES IN PATTERN
1846                                            .BYTE   001             ;BSEL0
1847                                            .BYTE   002             ;BSEL1
1848    002504  000020                         .BYTE   004             ;BSEL2
1849    002506     001                          .BYTE   010             ;BSEL3
1850    002507     002                          .BYTE   020             ;BSEL4
1851    002510     004                          .BYTE   040             ;BSEL5
1852    002511     010                          .BYTE   100             ;BSEL6
1853    002512     020                          .BYTE   200             ;BSEL7
1854    002513     040                          .BYTE   052             ;BSEL10
1855    002514     100                          .BYTE   300             ;BSEL11
1856    002515     200                          .BYTE   140             ;BSEL12
1857    002516     052                          .BYTE   060             ;BSEL13
1858    002517     300                          .BYTE   030             ;BSEL14
1859    002520     140                          .BYTE   014             ;BSEL15
1860    002521     060                          .BYTE   006             ;BSEL16
1861    002522     030                          .BYTE   003             ;BSEL17
1862    002523     014
1863    002524     006
1864    002525     003
1865
1866                                        .SBTTL  ***** DATA PATTERN B *****
1867
1868                                        .EVEN                           ;USAGE:
1869    002526  000026                 PATB:   .WORD   PATC-PATB-2     ;# OF BYTES IN PATTERN
1870    002530     125                          .BYTE   125
1871    002531     252                          .BYTE   252
1872    002532     000                          .BYTE   000
1873    002533     377                          .BYTE   377
1874    002534     001                          .BYTE   001
1875    002535     002                          .BYTE   002
1876    002536     004                          .BYTE   004
1877    002537     010                          .BYTE   010
1878    002540     020                          .BYTE   020
1879    002541     040                          .BYTE   040
1880    002542     100                          .BYTE   100
1881    002543     200                          .BYTE   200
1882    002544     376                          .BYTE   376
1883    002545     375                          .BYTE   375
1884    002546     373                          .BYTE   373
1885    002547     367                          .BYTE   367
1886    002550     357                          .BYTE   357
1887    002551     337                          .BYTE   337
1888    002552     277                          .BYTE   277
1889    002553     177                          .BYTE   177
1890    002554     000                          .BYTE   000
1891
```

```
                                        ***** 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
                                        PATC:   .WORD   <PATCR-PATC-2>/2
1898  002560      002     377                   .BYTE   2,377           ;SETUP ORB AS AN I/O (READ/WRITE) REGISTER
1899  002562      003     366                   .BYTE   3,366           ;SETUP ORA AS AN O/P REGISTER -- IT CAN'T BE TESTED!
1900  002564      000     100                   .BYTE   0,100           ;LOAD UP ORB
1901  002566      013     040                   .BYTE   13,040          ;       ACR
1902  002570      006     106                   .BYTE   6,106           ;       T1LL
1903  002572      007     107                   .BYTE   7,107           ;       T1LH
1904  002574      012     112                   .BYTE   12,112          ;       SR
1905  002576      014     042                   .BYTE   14,042          ;       PCR
1906  002600      015     000                   .BYTE   15,000          ;       IFR
1907  002602      016     200                   .BYTE   16,200          ;       IER
1908
1909                                    ;       THIS TABLE IS THE LIST OF EXPECTED CONTENTS OF THE VIA'S REGISTERS
1910
1911  002604      100                   PATCR:  .BYTE   100             ; ORB
1912  002605      000                           .BYTE   000             ; ORA
1913  002606      377                           .BYTE   377             ; DDRB
1914  002607      366                           .BYTE   366             ; DDRA
1915  002610      000                           .BYTE   000             ; T1CL
1916  002611      000                           .BYTE   000             ; T1CH
1917  002612      106                           .BYTE   106             ; T1LL
1918  002613      107                           .BYTE   107             ; T1LH
1919  002614      000                           .BYTE   000             ; T2CL
1920  002615      000                           .BYTE   000             ; T2CH
1921  002616      112                           .BYTE   112             ; SR
1922  002617      040                           .BYTE   040             ; ACR
1923  002620      042                           .BYTE   042             ; PCR
1924  002621      000                           .BYTE   000             ; IFR
1925  002622      200                           .BYTE   200             ; IER
1926  002623      000                           .BYTE   000             ; ORA
1927
1928                                    ;       THIS IS THE TABLE OF TEST PATTERN "A" MASKS. BEFORE A REGISTER'S
1929                                    ;       CONTENTS IS TESTED, A BICB IS DONE USING ITS RESPECTIVE BYTE FROM
1930                                    ;       THE TABLE BELOW (INSURING THAT "DON'T CARE" BITS ARE IGNORED).
1931
1932  002624      000                   PATCM:  .BYTE   000             ; ORB
1933  002625      377                           .BYTE   377             ; ORA -- THIS REGISTER CAN'T BE TESTED!!!
1934  002626      000                           .BYTE   000             ; DDRB
1935  002627      000                           .BYTE   000             ; DDRA
1936  002630      377                           .BYTE   377             ; T1CL -- THIS IS A FREE RUNNING COUNTER
1937  002631      377                           .BYTE   377             ; T1CH -- THIS IS A FREE RUNNING COUNTER
1938  002632      000                           .BYTE   000             ; T1LL
1939  002633      000                           .BYTE   000             ; T1LH
1940  002634      377                           .BYTE   377             ; T2CL -- THIS IS A FREE RUNNING COUNTER
1941  002635      377                           .BYTE   377             ; T2CH -- THIS IS A FREE RUNNING COUNTER
1942  002636      000                           .BYTE   000             ; SR
1943  002637      000                           .BYTE   000             ; ACR
1944  002640      000                           .BYTE   000             ; PCR
1945  002641      377                           .BYTE   377             ; IFR
1946  002642      200                           .BYTE   200             ; IER -- BIT 7 IS ALWAYS READ AS ZERO
1947  002643      377                           .BYTE   377             ; ORA -- THIS REGISTER CAN'T BE TESTED!!!
```

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

                                        .SBTTL  ***** DATA PAT'ERN D *****

                                        .EVEN
1948
1949
1950
1951   002644   000026                  PATD:   .WORD   PATE-PATD-2
1952   002646      200                          .BYTE   200
1953   002647      201                          .BYTE   201
1954   002650      202                          .BYTE   202
1955   002651      204                          .BYTE   204
1956   002652      210                          .BYTE   210
1957   002653      220                          .BYTE   220
1958   002654      240                          .BYTE   240
1959   002655      300                          .BYTE   300
1960   002656      200                          .BYTE   200
1961   002657      000                          .BYTE   000
1962   002660      001                          .BYTE   001
1963   002661      002                          .BYTE   002
1964   002662      004                          .BYTE   004
1965   002663      010                          .BYTE   010
1966   002664      020                          .BYTE   020
1967   002665      040                          .BYTE   040
1968   002666      100                          .BYTE   100
1969   002667      000                          .BYTE   000
1970   002670      325                          .BYTE   325
1971   002671      125                          .BYTE   125
1972   002672      252                          .BYTE   252
1973   002673      052                          .BYTE   052
1974
1975
1976                                    .SBTTL  ***** DATA PATTERN E *****
1977
1978                                    .EVEN
1979   002674   000026                  PATE:   .WORD   PATF-PATE-2
1980   002676      200                          .BYTE   200
1981   002677      201                          .BYTE   201
1982   002700      203                          .BYTE   203
1983   002701      207                          .BYTE   207
1984   002702      217                          .BYTE   217
1985   002703      237                          .BYTE   237
1986   002704      277                          .BYTE   277
1987   002705      377                          .BYTE   377
1988   002706      377                          .BYTE   377
1989   002707      377                          .BYTE   377
1990   002710      376                          .BYTE   376
1991   002711      374                          .BYTE   374
1992   002712      370                          .BYTE   370
1993   002713      360                          .BYTE   360
1994   002714      340                          .BYTE   340
1995   002715      300                          .BYTE   300
1996   002716      200                          .BYTE   200
1997   002717      200                          .BYTE   200
1998   002720      325                          .BYTE   325
1999   002721      200                          .BYTE   200
2000   002722      252                          .BYTE   252
2001   002723      200                          .BYTE   200
```

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

                        .SBTTL  ***** DATA PATTERN F *****

                        .EVEN
2005  002724  000045    PATF:   .WORD   <PATG-PATF-2>/2
2006  002726  125252            .WORD   125252
2007  002730  052525            .WORD   052525
2008  002732  000000            .WORD   000000
2009  002734  177777            .WORD   177777
2010  002736  000001            .WORD   000001
2011  002740  000002            .WORD   000002
2012  002742  000004            .WORD   000004
2013  002744  000010            .WORD   000010
2014  002746  000020            .WORD   000020
2015  002750  000040            .WORD   000040
2016  002752  000100            .WORD   000100
2017  002754  000200            .WORD   000200
2018  002756  000400            .WORD   000400
2019  002760  001000            .WORD   001000
2020  002762  002000            .WORD   002000
2021  002764  004000            .WORD   004000
2022  002766  010000            .WORD   010000
2023  002770  020000            .WORD   020000
2024  002772  040000            .WORD   040000
2025  002774  100000            .WORD   100000
2026  002776  177776            .WORD   177776
2027  003000  177775            .WORD   177775
2028  003002  177773            .WORD   177773
2029  003004  177767            .WORD   177767
2030  003006  177757            .WORD   177757
2031  003010  177737            .WORD   177737
2032  003012  177677            .WORD   177677
2033  003014  177577            .WORD   177577
2034  003016  177377            .WORD   177377
2035  003020  176777            .WORD   176777
2036  003022  175777            .WORD   175777
2037  003024  173777            .WORD   173777
2038  003026  167777            .WORD   167777
2039  003030  157777            .WORD   157777
2040  003032  137777            .WORD   137777
2041  003034  077777            .WORD   077777
2042  003036  000000            .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  000020          RESFT3: .BLKW   16.
                        .EVEN
```

```
                                .SBTTL  DATA BUFFER AREAS

003122  000400                  BUFAREA:        .BLKB   256.


                                ;  THIS BUFFER HAS SOME ALTERNATE USES TOO.  THE FOLLOWING LABELS ARE PROVIDED
                                ;  FOR THOSE USAGES.

        003322                  W0 = BUFAREA+128.       ;THIS WORD TABLE STARTS IN THE MIDDLE OF 'BUFAREA'
        003324                  W1 = W0+2               ;AND IS USED BY 'ERR6' FOR PRINTING BYTES
        003326                  W2 = W1+2
        003330                  W3 = W2+2
        003332                  W4 = W3+2
        003334                  W5 = W4+2
        003336                  W6 = W5+2
        003340                  W7 = W6+2
        003342                  W8 = W7+2
        003344                  W9 = W8+2
        003346                  WA = W9+2
        003350                  WB = WA+2
        003352                  WC = WB+2
        003354                  WD = WC+2
        003356                  WE = WD+2
        003360                  WF = WE+2

        003122                  BT1 = BUFAREA           ;BYTE TABLE # 1
        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
                                ;--*****************************************************************************
003522                                  DEVTYP  <M8053 OR M8064>
003522                                                                              L$DVTYP::
003522  034115  032460  020063                                                              .ASCIZ  /M8053 OR M8064/
003530  051117  046440  030070
003536  032066     000
        003542                                                                              .EVEN

                                ;++*****************************************************************************
                                ;* TITLE OF PROGRAM
                                ;--*****************************************************************************

        000012                  .RADIX  10.
003542                                  DESCRIPT   <DMV-11 U-CONTRL LOGIC DIAG - PART 1 OF 2>
003542                                                                              L$DESC::
003542  046504  026526  030461                                                              .ASCIZ  /DMV-11 U-CONTRL
003550  052440  041455  047117
003556  051124  020114  047514
003564  044507  020103  044504
003572  043501  026440  050040
003600  051101  020124  020061
003606  043117  031040     000
        003614                                                                              .EVEN
        000010                  .RADIX  8.
```

```
                        .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:
                        ;
                        ;       JSR     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
```

```
2188
2189  003666  004737  004434          3$:     JSR     PC,GETBSR       ;GET THE BSEL REGISTERS FOR DUMPING
2190  003672                          GTDF    20$,ERR3        ;MASTER CLEAR ERROR
2191                                  ;       QUEUE 'DEVICE FATAL'' ERROR # 1
2192  003672  012737  000001  002236                                          MOV     #T.EDF,ERRTYP
2193  003700  012737  000001  002240                                          MOV     #1,ERRNBR
2194  003706  012737  003734  002242                                          MOV     #20$,ERRMSG
2195  003714  012737  005414  002244                                          MOV     #ERR3,ERRBLK
2196  003722  000261                          SEC                     ;INDICATE TO THE CALLING ROUTINE THAT
2197  003724  000401                          BR      7$              ;   AN ERROR WAS DETECTED
2198
2199  003726  000241                  6$:     CLC                     ;CLEAR THE CARRY BIT TO INDICATE NO ERROR
2200  003730  012601                  7$:     MOV     (SP)+,R1        ;RESTORE REGISTER ONE
2201  003732  000207                          RTS     PC              ; RETURN TO THE CALLER
2202                                  .NLIST  BEX
      003734  040515  052123  051105  20$:     .ASCIZ  /MASTER CLEAR FAILURE/
                                      .LIST   BEX
2203          003762                  .EVEN
```

```
                                        .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,@BSEL2    ;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
```

```
2240                                    .SBTTL  M-LOOP -- READ
2241                                    ;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
2242                                    ; READ - READ THE SPECIFIED ADDRESS WITHIN THE DMV-11
2243                                    ;
2244                                    ;  CALLING SEQUENCE:
2245                                    ;
2246                                    ;       JSR     R5,READ
2247                                    ;       .WORD   <ADDRESS OF REGISTER WITHIN DMV-11>
2248                                    ;       .WORD   <DESTINATION ADDRESS WITHIN LSI-11>
2249                                    ;       BCC     N$              ;IF NO ERROR OCCURED, PROCEED WITH ROUTINE
2250                                    ;       ERROR                   ;AN ERROR MESSAGE HAS BEEN STACKED:  PRINT IT
2251                                    ;       <ANY OTHER SPECIAL ERROR PROCESSING MAY BE DONE HERE  (I.E. CKLOOP)>
2252                                    ;
2253                                    ; N$:   <RESUMPTION OF NORMAL PROCESSING>
2254                                    ;
2255                                    ;---------------------------------------------------------------------------------------
2256
2257  004064  012577  176272           READ:   MOV     (R5)+,@SEL4     ;SETUP SOURCE POINTER
2258  004070  112777  000001  176260           MOVB    #REDLOC,@BSEL2  ;TELL M-LOOP TO GIVE US THE REQUESTED DATA
2259
2260  004076  010346                           MOV     R3,-(SP)
2261  004100  012703  000032                   MOV     #26.,R3         ;WAIT FOR THE M-LOOP TO FINISH THE OPERATION
2262  004104  077301                   1$:     SOB     R3,1$
2263  004106  012603                           MOV     (SP)+,R3
2264
2265  004110  132777  000200  176240           BITB    #MRDY,@BSEL2    ;DID THE M-LOOP FINISH
2266  004116  001023                           BNE     5$              ;YES,  GOOD.  RETURN
2267
2268  004120  004737  004576                   JSR     PC,GETWSR       ;GET BYTE SELECT REGISTERS
2269  004124  012737  000001  002310           MOV     #REDLOC,GDATA   ;IDENTIFY REQUESTED FUNCTION
2270  004132                                   GTDF    EM4,ERR4        ;''MRDY'' TIMEOUT
2271                                           ;       QUEUE ''DEVICE FATAL'' ERROR # 3
2272  004132  012737  000001  002236                                                   MOV     #T.EDF,ERRTYP
2273  004140  012737  000003  002240                                                   MOV     #3,ERRNBR
2274  004146  012737  014500  002242                                                   MOV     #EM4,ERRMSG
2275  004154  012737  005426  002244                                                   MOV     #ERR4,ERRBLK
2276  004162  000261                           SEC                     ;INDICATE AN ERROR HAS BEEN STACKED
2277  004164  000401                           BR      6$              ;RETURN WITH THAT INDICATION
2278
2279  004166  000241                   5$:     CLC                     ;INDICATE ''NO ERROR''
2280  004170  117735  176172           6$:     MOVB    @BSEL6,@(R5)+   ;PUT DATA WHERE CALLER WANTS IT
2281  004174  000205                           RTS     R5              ;RETURN
```

```
                                         .SBTTL  M-LOOP -- READ IMMEDIATE
                                         ;++*********************************************************************
                                         ; READI - READ IMMEDIATE THE SPECIFIED ADDRESS WITHIN THE DMV-11
                                         ;
                                         ; CALLING SEQUENCE:
                                         ;
                                         ;         JSR     R5,READI
                                         ;         .WORD   <ADDRESS OF REGISTER WITHIN DMV-11>
                                         ;         .WORD   <DESTINATION -- CONTENTS OF REG. IS PUT HERE>
                                         ;         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>
                                         ;
                                         ;--*********************************************************************

 004176                                  READI:
 004176  012577  176160                           MOV     (R5)+,@SEL4     ;SETUP SOURCE POINTER
 004202  112777  000001  176146                   MOVB    #REDLOC,@BSEL2  ;TELL M-LOOP TO GIVE US THE REQUESTED DATA

 004210  010346                                   MOV     R3,-(SP)
 004212  012703  000015                           MOV     #13.,R3         ;WAIT FOR THE M-LOOP TO FINISH THE OPERATION
 004216  077301                          1$:      SOB     R3,1$
 004220  012603                                   MOV     (SP)+,R3

 004222  132777  000200  176126                   BITB    #MRDY,@BSEL2    ;DID THE M-LOOP FINISH
 004230  001023                                   BNE     5$              ;YES,  GOOD.  RETURN

 004232  004737  004576                           JSR     PC,GETWSR       ;GET BYTE SELECT REGISTERS
 004236  012737  000001  002310                   MOV     #REDLOC,GDATA   ;IDENTIFY REQUESTED FUNCTION
 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
 004274  000261                                   SEC                     ;INDICATE AN ERROR HAS BEEN STACKED
 004276  000401                                   BR      6$              ;RETURN WITH THAT INDICATION

 004300  000241                          5$:      CLC                     ;INDICATE 'NO ERROR''
 004302  017725  176060                  6$:      MOV     @SEL6,(R5)+     ;PUT DATA WHERE CALLER WANTS IT
 004306  000205                                   RTS     R5              ;RETURN
```

```
2325                                    .SBTTL  M-LOOP -- WRITE
2326                                    ;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
2327                                    ; WRITE - WRITE THE SPECIFIED DATA INTO THE SPECIFIED DMV-11 ADDRESS
2328                                    ;
2329                                    ;  CALLING SEQUENCE:
2330                                    ;
2331                                    ;       JSR     R5,WRITE
2332                                    ;       .WORD   <ADDRESS OF REGISTER WITHIN DMV-11>
2333                                    ;       .WORD   <ADDRESS OF DATA BYTE>
2334                                    ;       BCC     N$              ;IF NO ERROR OCCURED, PROCEED WITH ROUTINE
2335                                    ;       ERROR                   ;AN ERROR MESSAGE HAS BEEN STACKED:  PRINT IT
2336                                    ;       <ANY OTHER SPECIAL ERROR PROCESSING MAY BE DONE HERE  (I.E. CKLOOP)>
2337                                    ;
2338                                    ; N$:   <RESUMPTION OF NORMAL PROCESSING>
2339                                    ;
2340                                    ;--++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
2341
2342  004310  012577  176046            WRITE:  MOV     (R5)+,@SEL4     ;SETUP SOURCE POINTER
2343  004314  113577  176046                    MOVB    @(R5)+,@SEL6    ;MAKE DATA AVAILABLE TO M-LOOP
2344  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>
                                        ;
                                        ;--++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

004322                                  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                          1$:     MOV     R3,-(SP)
004342  012703  000050                          MOV     #40.,R3         ;WAIT FOR THE M-LOOP TO FINISH THE OPERATION
004346  077301                                  SOB     R3,1$
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

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
```

```
                                GLOBAL ERROR REPORT REPORT SECTION

                        .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
                        ;-------------------------------------------------------------------------
                                BGNMSG  ERR1
                                                                                        ERR1::
                                JSR     PC,NULERR       ;USE COMMON ROUTINE TO TERMINATE ERROR MESSAGE
                                ENDMSG
                                                                                        L10004:
                                                                                                TRAP    C$MSG
                        ;-------------------------------------------------------------------------
                        .SBTTL  ERROR HANDLER -- ERR2 -- CSR REGISTER ERROR REPORTING
                        ;-------------------------------------------------------------------------
                                BGNMSG  ERR2
                                                                                        ERR2::
                                PRINTB  #FMT02,#TXT5,REGNUM
                                                                                                MOV     REGNUM,-(SP)
                                                                                                MOV     #TXT5,-(SP)
                                                                                                MOV     #FMT02,-(SP)
                                                                                                MOV     #3,-(SP)
                                                                                                MOV     SP,R0
                                                                                                TRAP    C$PNTB
                                                                                                ADD     #10,SP
                                JSR     PC,XORGB
                                PRINTB  #FMT02A,<B,GDATA>,<B,BDATA>,<B,XDATA>
                                                                                                CLR     -(SP)
                                                                                                BISB    XDATA,(SP)
                                                                                                CLR     -(SP)
                                                                                                BISB    BDATA,(SP)
                                                                                                CLR     -(SP)
                                                                                                BISB    GDATA,(SP)
                                                                                                MOV     #FMT02A,-(SP)
                                                                                                MOV     #4,-(SP)
                                                                                                MOV     SP,R0
                                                                                                TRAP    C$PNTB
                                                                                                ADD     #12,SP
                                JSR     PC,ERR4$                ;DUMP THE BYTE SELECT REGISTERS
                                JSR     PC,NULERR       ;USE COMMON ROUTINE TO TERMINATE ERROR MESSAGE
                                ENDMSG
                                                                                        L10005:
                                                                                                TRAP    C$MSG
                        ;-------------------------------------------------------------------------
                        .SBTTL  ERROR HANDLER -- ERR3 -- DUMP THE BYTE SELECT REGISTERS
                        ;-------------------------------------------------------------------------
                                BGNMSG  ERR3
                                                                                        ERR3::
                                JSR     PC,ERR4$
                                JSR     PC,NULERR       ;USE COMMON ROUTINE TO TERMINATE ERROR MESSAGE
                                ENDMSG
                                                                                        L10006:
```

```
005424  104423                                                          TRAP    C$MSG
                        ;-----------------------------------------------------------------------
                        .SBTTL  ERROR HANDLER -- ERR4 -- M-LOOP TIMEOUT ERROR HANDLING
                        ;-----------------------------------------------------------------------
005426                          BGNMSG  ERR4
005426                                                          ERR4::
005426  010146                  MOV     R1,-(SP)                ;SAVE THE WORKING REGISTER
005430  113701  002310          MOVB    GDATA,R1                ;SAVE THIS FOR LATER
005434  122701  000017          CMPB    #17,R1                  ;WAS THIS AN M-LOOP REQUEST?
005440  103013                  BHIS    5$                      ;YES, THEN REPORT THE FUNCTION CODE
005442                          PRINTX  #FMT5,<B,R1>            ;NO,  THEN IT MUST BE A BSEL1 SETTING
005442  005046                                                          CLR     -(SP)
005444  150116                                                          BISB    R1,(SP)
005446  012746  012400                                                  MOV     #FMT5,-(SP)
005452  012746  000002                                                  MOV     #2,-(SP)
005456  010600                                                          MOV     SP,R0
005460  104415                                                          TRAP    C$PNTX
005462  062706  000006                                                  ADD     #6,SP
005466  000425                  BR      20$

005470  001001          5$:     BNE     6$                      ;IF IT WAS A 17, THIS IS A 'NOP' AND
005472  005001                  CLR     R1                      ;  THE TEXT POINTER MUST SO REFLECT.
005474  022701  000007  6$:     CMP     #7,R1                   ;IS FUNCTION CODE > 7?
005500  003002                  BGT     7$                      ;NO,  THEN WE CAN HANDLE IT
005502  012701  000006          MOV     #6,R1                   ;YES, THEN IT'S UNDEFINED -- SAY SO
005506  006301          7$:     ASL     R1                      ;CONVERT TO A WORD OFFSET
005510                          PRINTX  #FMT5A,<B,GDATA>,TXTMLT(R1)     ;REPORT THE FAILING FUNCTION
005510  016146  017532                                                  MOV     TXTMLT(R1),-(SP)
005514  005046                                                          CLR     -(SP)
005516  153716  002310                                                  BISB    GDATA,(SP)
005522  012746  012443                                                  MOV     #FMT5A,-(SP)
005526  012746  000003                                                  MOV     #3,-(SP)
005532  010600                                                          MOV     SP,R0
005534  104415                                                          TRAP    C$PNTX
005536  062706  000010                                                  ADD     #10,SP

005542  012601          20$:    MOV     (SP)+,R1                ;RESTORE THE WORKING REGISTER
005544  004737  011710          JSR     PC,ERR5$                ;DUMP THE SELECT REGISTERS
005550                          ENDMSG
005550                                                          L10007:
005550  104423                                                          TRAP    C$MSG
                        ;-----------------------------------------------------------------------
                        .SBTTL  ERROR HANDLER -- ERR5 -- WORD SELECT REG. ERRORS
                        ;-----------------------------------------------------------------------
005552                          BGNMSG  ERR5
005552                                                          ERR5::
005552                          PRINTB  #FMT02,#TXT5,REGNUM
005552  013746  002334                                                  MOV     REGNUM,-(SP)
005556  012746  013605                                                  MOV     #TXT5,-(SP)
005562  012746  012124                                                  MOV     #FMT02,-(SP)
005566  012746  000003                                                  MOV     #3,-(SP)
005572  010600                                                          MOV     SP,R0
005574  104414                                                          TRAP    C$PNTB
005576  062706  000010                                                  ADD     #10,SP
005602  004737  011276          JSR     PC,XORGB
005606                          PRINTB  #FMT10,GDATA,BDATA,XDATA
```

```
2749  005606  013746  002314                                                MOV     XDATA,-(SP)
2750  005612  013746  002312                                                MOV     BDATA,-(SP)
2751  005616  013746  002310                                                MOV     GDATA,-(SP)
2752  005622  012746  012654                                                MOV     #FMT10,-(SP)
2753  005626  012746  000004                                                MOV     #4,-(SP)
2754  005632  010600                                                        MOV     SP,R0
2755  005634  104414                                                        TRAP    C$PNTB
2756  005636  062706  000012                                                ADD     #12,SP
2757  005642  004737  011710          JSR     PC,ERR5$                ;DUMP THE SELECT REGISTERS
2758  005646                          ENDMSG
2759  005646                                                          L10010:
2760  005646  104423                                                        TRAP    C$MSG
2761                  ;-------------------------------------------------------------------
2762                  .SBTTL  ERROR HANDLER -- ERR6 -- VIA REGISTER ERRORS W/FULL REG. DUMP
2763                  ;-------------------------------------------------------------------
2764  005650          BGNMSG  ERR6
2765  005650                                                          ERR6::
2766                  ;*** PRINT THE FIRST HALF OF THE REGISTERS ***
2767  005650  010146  MOV     R1,-(SP)        ;PRESERVE R1'S CONTENTS
2768  005652  012701  002604  MOV     #PATCR,R1       ;POINT TO EXPECTED VALUES
2769  005656          PRINTX  #FMT06,#TXT7
2770  005656  012746  013632                                                MOV     #TXT7,-(SP)
2771  005662  012746  012562                                                MOV     #FMT06,-(SP)
2772  005666  012746  000002                                                MOV     #2,-(SP)
2773  005672  010600                                                        MOV     SP,R0
2774  005674  104415                                                        TRAP    C$PNTX
2775  005676  062706  000006                                                ADD     #6,SP
2776  005702          PRINTX  #FMT06A,#TXT8A,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>,<B,(R1)
2777  005702  005046                                                        CLR     -(SP)
2778  005704  152116                                                        BISB    (R1)+,(SP)
2779  005706  005046                                                        CLR     -(SP)
2780  005710  152116                                                        BISB    (R1)+,(SP)
2781  005712  005046                                                        CLR     -(SP)
2782  005714  152116                                                        BISB    (R1)+,(SP)
2783  005716  005046                                                        CLR     -(SP)
2784  005720  152116                                                        BISB    (R1)+,(SP)
2785  005722  005046                                                        CLR     -(SP)
2786  005724  152116                                                        BISB    (R1)+,(SP)
2787  005726  005046                                                        CLR     -(SP)
2788  005730  152116                                                        BISB    (R1)+,(SP)
2789  005732  012746  014004                                                MOV     #TXT8A,-(SP)
2790  005736  012746  012571                                                MOV     #FMT06A,-(SP)
2791  005742  012746  000010                                                MOV     #10,-(SP)
2792  005746  010600                                                        MOV     SP,R0
2793  005750  104415                                                        TRAP    C$PNTX
2794  005752  062706  000022                                                ADD     #22,SP
2795  005756
2796  005756  005046          PRINTX  #FMT06B,<B,(R1)+>,<B,(R1)+>
2797  005760  152116                                                        CLR     -(SP)
2798  005762  005046                                                        BISB    (R1)+,(SP)
2799  005764  152116                                                        CLR     -(SP)
2800  005766  012746  012637                                                BISB    (R1)+,(SP)
2801  005772  012746  000003                                                MOV     #FMT06B,-(SP)
2802  005776  010600                                                        MOV     #3,-(SP)
2803  006000  104415                                                        MOV     SP,R0
2804  006002  062706  000010                                                TRAP    C$PNTX
                                                                          ADD     #10,SP
```

```
                        ERROR HANDLER -- ERR6 -- VIA REGISTER ERRORS W/FULL REG. DUMP

2805  006006  012701  003122        MOV     #BT1,R1         ;POINT TO ACTUAL VALUES
2806  006012                        PRINTX  #FMT06A,#TXT8B,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>,<B,(R1)
2807  006012  005046                                                        CLR     -(SP)
2808  006014  152116                                                        BISB    (R1)+,(SP)
2809  006016  005046                                                        CLR     -(SP)
2810  006020  152116                                                        BISB    (R1)+,(SP)
2811  006022  005046                                                        CLR     -(SP)
2812  006024  152116                                                        BISB    (R1)+,(SP)
2813  006026  005046                                                        CLR     -(SP)
2814  006030  152116                                                        BISB    (R1)+,(SP)
2815  006032  005046                                                        CLR     -(SP)
2816  006034  152116                                                        BISB    (R1)+,(SP)
2817  006036  005046                                                        CLR     -(SP)
2818  006040  152116                                                        BISB    (R1)+,(SP)
2819  006042  012746  014021                                              MOV     #TXT8B,-(SP)
2820  006046  012746  012571                                              MOV     #FMT06A,-(SP)
2821  006052  012746  000010                                              MOV     #10,-(SP)
2822  006056  010600                                                       MOV     SP,R0
2823  006060  104415                                                       TRAP    C$PNTX
2824  006062  062706  000022                                              ADD     #22,SP
2825  006066                        PRINTX  #FMT06B,<B,(R1)+>,<B,(R1)+>
2826  006066  005046                                                        CLR     -(SP)
2827  006070  152116                                                        BISB    (R1)+,(SP)
2828  006072  005046                                                        CLR     -(SP)
2829  006074  152116                                                        BISB    (R1)+,(SP)
2830  006076  012746  012637                                              MOV     #FMT06B,-(SP)
2831  006102  012746  000003                                              MOV     #3,-(SP)
2832  006106  010600                                                       MOV     SP,R0
2833  006110  104415                                                       TRAP    C$PNTX
2834  006112  062706  000010                                              ADD     #10,SP
2835  006116  012701  003206       MOV     #BT2,R1         ;POINT TO XOR VALUES
2836  006122                       PRINTX  #FMT06A,#TXT8C,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>,<B,(R1)
2837  006122  005046                                                        CLR     -(SP)
2838  006124  152116                                                        BISB    (R1)+,(SP)
2839  006126  005046                                                        CLR     -(SP)
2840  006130  152116                                                        BISB    (R1)+,(SP)
2841  006132  005046                                                        CLR     -(SP)
2842  006134  152116                                                        BISB    (R1)+,(SP)
2843  006136  005046                                                        CLR     -(SP)
2844  006140  152116                                                        BISB    (R1)+,(SP)
2845  006142  005046                                                        CLR     -(SP)
2846  006144  152116                                                        BISB    (R1)+,(SP)
2847  006146  005046                                                        CLR     -(SP)
2848  006150  152116                                                        BISB    (R1)+,(SP)
2849  006152  012746  014036                                              MOV     #TXT8C,-(SP)
2850  006156  012746  012571                                              MOV     #FMT06A,-(SP)
2851  006162  012746  000010                                              MOV     #10,-(SP)
2852  006166  010600                                                       MOV     SP,R0
2853  006170  104415                                                       TRAP    C$PNTX
2854  006172  062706  000022                                              ADD     #22,SP
2855  006176                        PRINTX  #FMT06B,<B,(R1)+>,<B,(R1)+>
2856  006176  005046                                                        CLR     -(SP)
2857  006200  152116                                                        BISB    (R1)+,(SP)
2858  006202  005046                                                        CLR     -(SP)
2859  006204  152116                                                        BISB    (R1)+,(SP)
2860  006206  012746  012637                                              MOV     #FMT06B,-(SP)
```

```
2861  006212  012746  000003                                                    MOV     #3,-(SP)
2862  006216  010600                                                            MOV     SP,R0
2863  006220  104415                                                            TRAP    C$PNTX
2864  006222  062706  000010                                                    ADD     #10,SP
2865
2866  006226  012701  002614          ;*** PRINT SECOND HALF OF THE REGISTERS ***
                                      MOV     #PATCR+8.,R1    ;POINT TO 2ND HALF OF REGISTERS EXPECTED VALUES
2867  006232
2868  006232  012746  013717          PRINTX  #FMT06,#TXT7A                     MOV     #TXT7A,-(SP)
2869  006236  012746  012562                                                    MOV     #FMT06,-(SP)
2870  006242  012746  000002                                                    MOV     #2,-(SP)
2871  006246  010600                                                            MOV     SP,R0
2872  006250  104415                                                            TRAP    C$PNTX
2873  006252  062706  000006                                                    ADD     #6,SP
2874  006256          PRINTX  #FMT06A,#TXT8A,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>,<B,(R1)
2875  006256  005046                                                            CLR     -(SP)
2876  006260  152116                                                            BISB    (R1)+,(SP)
2877  006262  005046                                                            CLR     -(SP)
2878  006264  152116                                                            BISB    (R1)+,(SP)
2879  006266  005046                                                            CLR     -(SP)
2880  006270  152116                                                            BISB    (R1)+,(SP)
2881  006272  005046                                                            CLR     -(SP)
2882  006274  152116                                                            BISB    (R1)+,(SP)
2883  006276  005046                                                            CLR     -(SP)
2884  006300  152116                                                            BISB    (R1)+,(SP)
2885  006302  005046                                                            CLR     -(SP)
2886  006304  152116                                                            BISB    (R1)+,(SP)
2887  006306  012746  014004                                                    MOV     #TXT8A,-(SP)
2888  006312  012746  012571                                                    MOV     #FMT06A,-(SP)
2889  006316  012746  000010                                                    MOV     #10,-(SP)
2890  006322  010600                                                            MOV     SP,R0
2891  006324  104415                                                            TRAP    C$PNTX
2892  006326  062706  000022                                                    ADD     #22,SP
2893  006332          PRINTX  #FMT06B,<B,(R1)+>,<B,(R1)+>
2894  006332  005046                                                            CLR     -(SP)
2895  006334  152116                                                            BISB    (R1)+,(SP)
2896  006336  005046                                                            CLR     -(SP)
2897  006340  152116                                                            BISB    (R1)+,(SP)
2898  006342  012746  012637                                                    MOV     #FMT06B,-(SP)
2899  006346  012746  000003                                                    MOV     #3,-(SP)
2900  006352  010600                                                            MOV     SP,R0
2901  006354  104415                                                            TRAP    C$PNTX
2902  006356  062706  000010                                                    ADD     #10,SP
2903  006362  012701  003132          MOV     #BT1+8.,R1      ;POINT TO 2ND HALF OF ACTUAL VALUES
2904  006366          PRINTX  #FMT06A,#TXT8B,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>,<B,(R1)
2905  006366  005046                                                            CLR     -(SP)
2906  006370  152116                                                            BISB    (R1)+,(SP)
2907  006372  005046                                                            CLR     -(SP)
2908  006374  152116                                                            BISB    (R1)+,(SP)
2909  006376  005046                                                            CLR     -(SP)
2910  006400  152116                                                            BISB    (R1)+,(SP)
2911  006402  005046                                                            CLR     -(SP)
2912  006404  152116                                                            BISB    (R1)+,(SP)
2913  006406  005046                                                            CLR     -(SP)
2914  006410  152116                                                            BISB    (R1)+,(SP)
2915  006412  005046                                                            CLR     -(SP)
2916  006414  152116                                                            BISB    (R1)+,(SP)
```

```
2917  006416  012746  014021                                                  MOV     #TXT8B,-(SP)
2918  006422  012746  012571                                                  MOV     #FMT06A,-(SP)
2919  006426  012746  000010                                                  MOV     #10,-(SP)
2920  006432  010600                                                          MOV     SP,R0
2921  006434  104415                                                          TRAP    C$PNTX
2922  006436  062706  000022                                                  ADD     #22,SP
2923  006442                      PRINTX  #FMT06B,<B,(R1)+>,<B,(R1)+>
2924  006442  005046                                                          CLR     -(SP)
2925  006444  152116                                                          BISB    (R1)+,(SP)
2926  006446  005046                                                          CLR     -(SP)
2927  006450  152116                                                          BISB    (R1)+,(SP)
2928  006452  012746  012637                                                  MOV     #FMT06B,-(SP)
2929  006456  012746  000003                                                  MOV     #3,-(SP)
2930  006462  010600                                                          MOV     SP,R0
2931  006464  104415                                                          TRAP    C$PNTX
2932  006466  062706  000010                                                  ADD     #10,SP
2933  006472  012701  003216              MOV     #BT2+8.,R1      ;POINT TO 2ND HALF OF XOR VALUES
2934  006476                      PRINTX  #FMT06A,#TXT8C,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>,<B,(R1)+>,<B,(R1)
2935  006476  005046                                                          CLR     -(SP)
2936  006500  152116                                                          BISB    (R1)+,(SP)
2937  006502  005046                                                          CLR     -(SP)
2938  006504  152116                                                          BISB    (R1)+,(SP)
2939  006506  005046                                                          CLR     -(SP)
2940  006510  152116                                                          BISB    (R1)+,(SP)
2941  006512  005046                                                          CLR     -(SP)
2942  006514  152116                                                          BISB    (R1)+,(SP)
2943  006516  005046                                                          CLR     -(SP)
2944  006520  152116                                                          BISB    (R1)+,(SP)
2945  006522  005046                                                          CLR     -(SP)
2946  006524  152116                                                          BISB    (R1)+,(SP)
2947  006526  012746  014036                                                  MOV     #TXT8C,-(SP)
2948  006532  012746  012571                                                  MOV     #FMT06A,-(SP)
2949  006536  012746  000010                                                  MOV     #10,-(SP)
2950  006542  010600                                                          MOV     SP,R0
2951  006544  104415                                                          TRAP    C$PNTX
2952  006546  062706  000022                                                  ADD     #22,SP
2953  006552                      PRINTX  #FMT06B,<B,(R1)+>,<B,(R1)+>
2954  006552  005046                                                          CLR     -(SP)
2955  006554  152116                                                          BISB    (R1)+,(SP)
2956  006556  005046                                                          CLR     -(SP)
2957  006560  152116                                                          BISB    (R1)+,(SP)
2958  006562  012746  012637                                                  MOV     #FMT06B,-(SP)
2959  006566  012746  000003                                                  MOV     #3,-(SP)
2960  006572  010600                                                          MOV     SP,R0
2961  006574  104415                                                          TRAP    C$PNTX
2962  006576  062706  000010                                                  ADD     #10,SP
2963  006602  012601              MOV     (SP)+,R1        ;RESTORE R1
2964  006604  004737  012072      JSR     PC,NULERR       ;USE COMMON ROUTINE TO TERMINATE ERROR MESSAGE
2965  006610                      ENDMSG
2966  006610                                                          L10011:
2967  006610  104423                                                          TRAP    C$MSG
2968                      ;-------------------------------------------------------------------------------
2969                      .SBTTL  ERROR HANDLER -- ERR7 -- VIA REGISTER ERRORS
2970                      ;-------------------------------------------------------------------------------
2971  006612              BGNMSG  ERR7
2972  006612                                                          ERR7::
```

```
2973  006612  113701  002334
2974  006616  006301
2975  006620
2976  006620  016146  017554
2977  006624  012746  014327
2978  006630  012746  012530
2979  006634  012746  000003
2980  006640  010600
2981  006642  104414
2982  006644  062706  000010
2983  006650  004737  011276
2984  006654
2985  006654  005046
2986  006656  153716  002314
2987  006662  005046
2988  006664  153716  002312
2989  006670  005046
2990  006672  153716  002310
2991  006676  012746  012161
2992  006702  012746  000004
2993  006706  010600
2994  006710  104414
2995  006712  062706  000012
2996  006716  004737  012072
2997  006722
2998  006722
2999  006722  104423
3000
3001
3002
3003  006724
3004  006724
3005
3006
3007  006724  013700  002444
3008  006730  001404
3009  006732  020027  000006
3010  006736  003401
3011  006740  005000
3012  006742  006300
3013  006744  016000  007614
3014  006750
3015  006750  010046
3016  006752  012746  007232
3017  006756  012746  000002
3018  006762  010600
3019  006764  104415
3020  006766  062706  000006
3021
3022
3023  006772
3024  006772  012746  007263
3025  006776  012746  000001
3026  007002  010600
3027  007004  104415
3028  007006  062706  000004
```

```
;ERROR HANDLER -- ERR7 -- VIA REGISTER ERRORS

        MOVB    REGNUM,R1
        ASL     R1              ;AS PASSED, THIS WAS A BYTE OFFSET
        PRINTB  #FMT07,#TXTVR,TXTVRT(R1)
                                                        MOV     TXTVRT(R1),-(SP)
                                                        MOV     #TXTVR,-(SP)
                                                        MOV     #FMT07,-(SP)
                                                        MOV     #3,-(SP)
                                                        MOV     SP,R0
                                                        TRAP    C$PNTB
                                                        ADD     #10,SP
        JSR     PC,XORGB
        PRINTB  #FMT02A,<B,GDATA>,<B,BDATA>,<B,XDATA>
                                                        CLR     -(SP)
                                                        BISB    XDATA,(SP)
                                                        CLR     -(SP)
                                                        BISB    BDATA,(SP)
                                                        CLR     -(SP)
                                                        BISB    GDATA,(SP)
                                                        MOV     #FMT02A,-(SP)
                                                        MOV     #4,-(SP)
                                                        MOV     SP,R0
                                                        TRAP    C$PNTB
                                                        ADD     #12,SP
        JSR     PC,NULERR       ;USE COMMON ROUTINE TO TERMINATE ERROR MESSAGE
        ENDMSG
                                                L10012:
                                                        TRAP    C$MSG
;-------------------------------------------------------------------------------
.SBTTL  ERROR HANDLER -- ERR47 -- FOR RAM DATA ERRORS IN STATIC TEST(S)
;-------------------------------------------------------------------------------
        BGNMSG  ERR47
                                                ERR47::
;       PRINT HEADING LINE # 1

        MOV     TMP2,R0         ;GET TEST PATTERN CODE
        BEQ     2$              ;ZERO IS UNDEFINED BUT THERE IS TEXT TO SAY THAT
        CMP     R0,#6           ;THIS IT ALL WE UNDERSTAND FOR NOW
        BLE     2$              ;IF WITHIN LIMITS, LET IT GO
        CLR     R0              ;ELSE, MAKE IT 0 FOR 'UNDEFINED'
2$:     ASL     R0              ;CONVERT TO A WORD INDEX
        MOV     TXT47P(R0),R0   ;GET ADDRESS OF REQUIRED TEXT
        PRINTX  #FMT47A,R0      ;IDENTIFY TEST PATTERN BEING USED
                                                        MOV     R0,-(SP)
                                                        MOV     #FMT47A,-(SP)
                                                        MOV     #2,-(SP)
                                                        MOV     SP,R0
                                                        TRAP    C$PNTX
                                                        ADD     #6,SP
;       PRINT HEADING LINE # 2

        PRINTX  #FMT47B         ;STANDARD PORTION OF LINE 2
                                                        MOV     #FMT47B,-(SP)
                                                        MOV     #1,-(SP)
                                                        MOV     SP,R0
                                                        TRAP    C$PNTX
                                                        ADD     #4,SP
```

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

                ;       PRINT HEADING LINE # 3

                        PRINTX  #FMT47C         ;STANDARD PORTION OF LINE 3
                                                                        MOV     #FMT47C,-(SP)
                                                                        MOV     #1,-(SP)
                                                                        MOV     SP,R0
                                                                        TRAP    C$PNTX
                                                                        ADD     #4,SP
                ;       PRINT HEADING LINE # 4

                        PRINTX  #FMT47E         ;STANDARD PORTION OF LINE 4
                                                                        MOV     #FMT47E,-(SP)
                                                                        MOV     #1,-(SP)
                                                                        MOV     SP,R0
                                                                        TRAP    C$PNTX
                                                                        ADD     #4,SP
                ;       GO PRINT DATA PORTION OF ERROR MESSAGE

                        PRINTX  #NEWLIN         ;TERMINATE HEADER & CAUSE 1 BLANK LINE
                                                                        MOV     #NEWLIN,-(SP)
                                                                        MOV     #1,-(SP)
                                                                        MOV     SP,R0
                                                                        TRAP    C$PNTX
                                                                        ADD     #4,SP
                        CLR     ER47CT          ;RE-INITIALIZE THE DATA LINE COUNTER
                        JSR     PC,ERR47.       ;USE COMMON SUBROUTINE TO REPORT DATA
                        ENDMSG
                                                                L10013:
                                                                        TRAP    C$MSG

                ER47CT: .WORD   0               ;THIS VARIABLE WILL COUNT THE DATA LINES
                ER47MX: .WORD   16.             ;THIS CONSTANT LIMITS THE DATA LINES PRINTED

                ERR47.:

                        CMP     ER47CT,ER47MX   ;HAVE WE REPORTED ENOUGH OF THESE DATA LINES?
                        BHIS    60$             ;YES,  BYPASS THIS WHOLE ROUTINE AND EXIT
                        INC     ER47CT          ;NO,   COUNT THIS LINE

                        MOVB    TMP4,R1         ;GET EXPECTED DATA
                        MOVB    TMP5,R3         ;SETUP TO CALCULATE XOR
                        XOR     R1,R3           ;CALCULATE XOR OF EXPECTED & ACTUAL DATA
                        PRINTX  #FMT47G,TMPA,<B,R1>,<B,TMP5>,<B,R3> ;PRINT DATA LINE
                                                                        CLR     -(SP)
                                                                        BISB    R3,(SP)
                                                                        CLR     -(SP)
                                                                        BISB    TMP5,(SP)
                                                                        CLR     -(SP)
                                                                        BISB    R1,(SP)
                                                                        MOV     TMPA,-(SP)
                                                                        MOV     #FMT47G,-(SP)
                                                                        MOV     #5,-(SP)
                                                                        MOV     SP,R0
                                                                        TRAP    C$PNTX
                                                                        ADD     #14,SP
                        CMP     ER47CT,ER47MX   ;IF THESE TWO ARE EQUAL, WE WON'T BE PRINTING
```

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

3085  007206  001010                        BNE     60$             ;ANY MORE LINES FOR A WHILE.  SO,
3086  007210                                PRINTX  #FMT48I         ;  PUT OUT A MESSAGE TO THAT EFFECT.
3087  007210  012746  010644                                                        MOV     #FMT48I,-(SP)
3088  007214  012746  000001                                                        MOV     #1,-(SP)
3089  007220  010600                                                                MOV     SP,R0
3090  007222  104415                                                                TRAP    C$PNTX
3091  007224  062706  000004                                                        ADD     #4,SP
3092  007230  000207                        60$:    RTS     PC
3093
3094                                        .NLIST  BEX
      007232  047045  051445  022462        FMT47A: .ASCIZ  \%N%S2%ATEST PATTERN:  %T\
      007263     045  022516  031123        FMT47B: .ASCIZ  \%N%S2%A  (ALL VALUES IN OCTAL)\
      007322  047045  051445  022463        FMT47C: .ASCIZ  \%N%S3%A  RAM   SHOULD\
      007350  047045  051445  022463        FMT47E: .ASCIZ  \%N%S3%AADDRESS   BE    IS  XOR\
      007407     045  022516  032123        FMT47G: .ASCIZ  \%N%S4%04%S4%03%S3%03%S2%03\
      007442  046101  020114  047117        TXT47C: .ASCIZ  \ALL ONES\
      007453     101  046114  055040        TXT47D: .ASCIZ  \ALL ZEROES\
      007466  020061  044502  020124        TXT47E: .ASCIZ  \1 BIT ALTERNATING\
      007510  020062  044502  051524        TXT47F: .ASCIZ  \2 BITS ALTERNATING\
      007533     101  042104  042522        TXT47G: .ASCIZ  \ADDRESS IN ADDRESS\
      007556  047111  051103  046505        TXT47H: .ASCIZ  \INCREMENTAL VALUE IN ADDRESS\
                                            .LIST   BEX
3095          007614                        .EVEN
3096  007614  014235  007442  007453        TXT47P: .WORD   TXTML6,TXT47C,TXT47D,TX147E,TXT47F,TXT47G,TXT47H
3097  007622  007466  007510  007533
3098  007630  007556
3099
3100                                        ;       'TXTML6'' ABOVE IS DEFINED AS 'UNDEFINED'' IN THE M-LOOP FUNCTION DEF'S.
3101
3102                                        ;-------------------------------------------------------------------------
3103                                        .SBTTL  ERROR HANDLER -- ERR48 -- FOR DATA ERRORS IN 'MOVING INVERSIONS TEST''
3104                                        ;-------------------------------------------------------------------------
3105  007632                                        BGNMSG  ERR48
3106  007632                                                                        ERR48::
3107                                        ;       PRINT HEADING LINE # 1
3108
3109  007632                                        PRINTX  #FMT48A         ;STANDARD PORTION OF LINE 1
3110  007632  012746  010300                                                        MOV     #FMT48A,-(SP)
3111  007636  012746  000001                                                        MOV     #1,-(SP)
3112  007642  010600                                                                MOV     SP,R0
3113  007644  104415                                                                TRAP    C$PNTX
3114  007646  062706  000004                                                        ADD     #4,SP
3115  007652  032737  000004  002350                BIT     #BIT2,PFLAG     ;IF EXTENDED INFORMATION REQUESTED,
3116  007660  001410                                BEQ     2$
3117  007662                                        PRINTX  #FMT48B         ;PRINT EXTENDED PORTION OF LINE 1
3118  007662  012746  010347                                                        MOV     #FMT48B,-(SP)
3119  007666  012746  000001                                                        MOV     #1,-(SP)
3120  007672  010600                                                                MOV     SP,R0
3121  007674  104415                                                                TRAP    C$PNTX
3122  007676  062706  000004                                                        ADD     #4,SP
3123                                        ;       PRINT HEADING LINE # 2
3124
3125  007702                                2$:     PRINTX  #FMT48C         ;STANDARD PORTION OF LINE 2
3126  007702  012746  010402                                                        MOV     #FMT48C,-(SP)
3127  007706  012746  000001                                                        MOV     #1,-(SP)
3128  007712  010600                                                                MOV     SP,R0
```

```
3129  007714  104415                                                          TRAP    C$PNTX
3130  007716  062706  000004                                                  ADD     #4,SP
3131
3132                          ;       PRINT HEADING LINE # 3
3133
3134  007722                          PRINTX  #FMT48E         ;STANDARD PORTION OF LINE 3
3135  007722  012746  010437                                                  MOV     #FMT48E,-(SP)
3136  007726  012746  000001                                                  MOV     #1,-(SP)
3137  007732  010600                                                          MOV     SP,R0
3138  007734  104415                                                          TRAP    C$PNTX
3139  007736  062706  000004                                                  ADD     #4,SP
3140  007742  032737  000004  002350          BIT     #BIT2,PFLAG     ;IF EXTENDED INFORMATION REQUESTED,
3141  007750  001410                          BEQ     6$
3142  007752                          PRINTX  #FMT48F         ;PRINT EXTENDED PORTION OF LINE 3
3143  007752  012746  010506                                                  MOV     #FMT48F,-(SP)
3144  007756  012746  000001                                                  MOV     #1,-(SP)
3145  007762  010600                                                          MOV     SP,R0
3146  007764  104415                                                          TRAP    C$PNTX
3147  007766  062706  000004                                                  ADD     #4,SP
3148                          ;       GO PRINT DATA PORTION OF ERROR MESSAGE
3149
3150  007772                  6$:     PRINTX  #NEWLIN         ;TERMINATE HEADER & CAUSE 1 BLANK LINE
3151  007772  012746  012121                                                  MOV     #NEWLIN,-(SP)
3152  007776  012746  000001                                                  MOV     #1,-(SP)
3153  010002  010600                                                          MOV     SP,R0
3154  010004  104415                                                          TRAP    C$PNTX
3155  010006  062706  000004                                                  ADD     #4,SP
3156  010012  005037  010024          CLR     ER48CT          ;RE-INITIALIZE THE DATA LINE COUNTER
3157  010016  004737  010030          JSR     PC,ERR48.       ;USE COMMON SUBROUTINE TO REPORT DATA
3158  010022                          ENDMSG
3159  010022                                                                  L10014:
3160  010022  104423                                                                  TRAP    C$MSG
3161
3162  010024  000000          ER48CT: .WORD   0               ;THIS VARIABLE WILL COUNT THE DATA LINES
3163  010026  000020          ER48MX: .WORD   16.             ;THIS CONSTANT LIMITS THE DATA LINES PRINTED
3164
3165  010030                  ERR48.:
3166
3167  010030  023737  010024  010026          CMP     ER48CT,ER48MX   ;HAVE WE REPORTED ENOUGH OF THESE DATA LINES?
3168  010036  103117                          BHIS    60$             ;YES,  BYPASS THIS WHOLE ROUTINE AND EXIT
3169  010040  005237  010024                  INC     ER48CT          ;NO,   COUNT THIS LINE
3170
3171                          ; DETERMINT WHICH ERROR CALL GOT US HERE -- PRE-WRITE OR POST-WRITE:
3172
3173  010044  032737  000002  002476          BIT     #BIT1,TMPF      ;DID PRE-WRITE ERROR CALL GET US HERE?
3174  010052  001405                          BEQ     2$              ;NO, THEN SETUP FOR 'POST'' IN ERROR MESSAGE
3175  010054  012700  010736                  MOV     #TXT48A,R0      ;YES, SETUP FOR 'PRE'' IN ERROR MESSAGE
3176  010060  113701  002450                  MOVB    TMP4,R1         ;GET EXPECTED DATA (BEFORE WRITING NEW VALUE)
3177  010064  000404                          BR      4$
3178
3179  010066  012700  010743          2$:     MOV     #TXT48B,R0      ;POINT TO 'POST'' TEXT
3180  010072  113701  002451                  MOVB    TMP4+1,R1       ;GET EXPECTED DATA (AFTER WRITING NEW VALUE)
3181  010076  013703  002452          4$:     MOV     TMP5,R3         ;SETUP TO CALCULATE XOR
3182  010102  074103                          XOR     R1,R3           ;CALCULATE XOR OF EXPECTED & ACTUAL DATA
3183  010104                          PRINTX  #FMT48G,R0,TMPA,<B,R1>,<B,TMP5>,<B,R3> ;PRINT STANDARD DATA LINE
3184  010104  005046                                                                  CLR     -(SP)
```

```
3185  010106  150316                                                          BISB    R3,(SP)
3186  010110  005046                                                          CLR     -(SP)
3187  010112  153716  002452                                                  BISB    TMP5,(SP)
3188  010116  005046                                                          CLR     -(SP)
3189  010120  150116                                                          BISB    R1,(SP)
3190  010122  013746  002464                                                  MOV     TMPA,-(SP)
3191  010126  010046                                                          MOV     R0,-(SP)
3192  010130  012746  010551                                                  MOV     #FMT48G,-(SP)
3193  010134  012746  000006                                                  MOV     #6,-(SP)
3194  010140  010600                                                          MOV     SP,R0
3195  010142  104415                                                          TRAP    C$PNTX
3196  010144  062706  000016                                                  ADD     #16,SP
3197  010150  032737  000004  002350          BIT     #BIT2,PFLAG     ;IF EXTENDED INFORMATION REQUESTED,
3198  010156  001433                          BEQ     10$
3199                                                                  ;SETUP FOR PRINTING OF EXTENDED INFORMATION
3200  010160  013701  002470                  MOV     TMPC,R1         ;DATA BIT VALUE (0 OR 1)
3201  010164  042701  177776                  BIC     #^CBIT0,R1      ;  MAKE SURE WE ONLY HAVE ONE BIT
3202  010170  005737  002472                  TST     TMPD            ;DIRECTION?
3203  010174  001003                          BNE     6$              ;BACKWARD --
3204  010176  012700  010750                  MOV     #TXT48C,R0      ;FORWARD ---
3205  010202  000402                          BR      8$
3206  010204  012700  010755          6$:     MOV     #TXT48D,R0      ;BACKWARD --
3207  010210                            8$:   PRINTX  #FMT48H,TMPB,R1,R0,<B,TMP9>  ;PRINT EXTENDED INFORMATION
3208  010210  005046                                                          CLR     -(SP)
3209  010212  153716  002462                                                  BISB    TMP9,(SP)
3210  010216  010046                                                          MOV     R0,-(SP)
3211  010220  010146                                                          MOV     R1,-(SP)
3212  010222  013746  002466                                                  MOV     TMPB,-(SP)
3213  010226  012746  010611                                                  MOV     #FMT48H,-(SP)
3214  010232  012746  000005                                                  MOV     #5,-(SP)
3215  010236  010600                                                          MOV     SP,R0
3216  010240  104415                                                          TRAP    C$PNTX
3217  010242  062706  000014                                                  ADD     #14,SP
3218  010246  023737  010024  010026  10$:     CMP     ER48CT,ER48MX   ;IF THESE TWO ARE EQUAL, WE WON'T BE PRINTING
3219  010254  001010                          BNE     60$             ;ANY MORE LINES FOR A WHILE.  SO,
3220  010256                                  PRINTX  #FMT48I         ;  PUT OUT A MESSAGE TO THAT EFFECT.
3221  010256  012746  010644                                                  MOV     #FMT48I,-(SP)
3222  010262  012746  000001                                                  MOV     #1,-(SP)
3223  010266  010600                                                          MOV     SP,R0
3224  010270  104415                                                          TRAP    C$PNTX
3225  010272  062706  000004                                                  ADD     #4,SP
3226  010276                            60$:
3227  010276  000207                          RTS     PC
3228                                    .NLIST  BEX
      010300  047045  051445  022462  FMT48A: .ASCIZ  \%N%S2%APRE OR    (ALL VALUES IN OCTAL)\
      010347     045  032523  040445  FMT48B: .ASCIZ  \%S5%AEXTENDED INFORMATION:\
      010402  047045  051445  022463  FMT48C: .ASCIZ  \%N%S3%APOST     RAM   SHOULD\
      010437     045  022516  031123  FMT48E: .ASCIZ  \%N%S2%AWRITE   ADDRESS   BE    IS  XOR\
      010506  051445  022465  041101  FMT48F: .ASCIZ  \%S5%ABIT  DATA   SEQ  LSB(DECIMAL)\
      010551     045  022516  031523  FMT48G: .ASCIZ  \%N%S3%T%S4%04%S4%03%S3%03%S2%03\
      010611     045  033123  047445  FMT48H: .ASCIZ  \%S6%01%S5%01%S3%T%S2%D2%A.\
      010644  047045  047045  051445  FMT48I: .ASCIZ  \%N%N%S5%AFURTHER DATA LINES SUPRESSED UNTIL NEW TEST DATA\
      010736  051120  020105     000  TXT48A: .ASCIZ  \PRE \
      010743     120  051517  000124  TXT48B: .ASCIZ  \POST\
      010750  043040  042127     000  TXT48C: .ASCIZ  \ FWD\
      010755     102  053513  000104  TXT48D: .ASCIZ  \BKWD\
```

```
                        ERROR HANDLER -- ERR48 -- FOR DATA ERRORS IN 'MOVING INVERSIONS TEST'

                        .LIST   BEX
                        .EVEN


                        ;-----------------------------------------------------------------------
                        .SBTTL  ERROR HANDLER -- ERR50 -- FOR REPORTING TIMER # 1 ERRORS
                        ;-----------------------------------------------------------------------
                                BGNMSG  ERR50
                                                                                ERR50::
                                MOV     R1,-(SP)        ;SAVE R1 FOR CALLER
                                MOVB    TMPB+1,R1       ;GET THE MODE LAST SETUP
                                CLC                     ;SEEING AS THE CARRY BIT WILL BE ROTATED INTO
                                                        ;THE DATA, WE HAD BETTER CLEAR IT JUST IN CASE.
                                BIC     #^C<BIT6+BIT7>,R1 ;LOOK @ JUST THE TIMER 1 MODE DEFINITION
                                ROLB    R1              ;POSITION IT FOR PRINTOUT
                                ROLB    R1
                                ROLB    R1

                                ;IDENTIFY THE MODE BEING USED AT THE TIME:

                                PRINTX  #FMT50A,R1
                                                                                        MOV     R1,-(SP)
                                                                                        MOV     #FMT50A,-(SP)
                                                                                        MOV     #2,-(SP)
                                                                                        MOV     SP,R0
                                                                                        TRAP    C$PNTX
                                                                                        ADD     #6,SP
                                ;PRINT THE HEADING TO IDENTIFY THE REGISTERS:

                                PRINTX  #FMT50B
                                                                                        MOV     #FMT50B,-(SP)
                                                                                        MOV     #1,-(SP)
                                                                                        MOV     SP,R0
                                                                                        TRAP    C$PNTX
                                                                                        ADD     #4,SP
                                ;AND THE VALUES THAT WERE LOADED INTO THE REGISTERS:

                                PRINTX  #FMT50C,#TXT8D,<B,TMP5+1>,<B,TMP4+1>,<B,TMP7+1>,<B,TMP6+1>
                                                                                        CLR     -(SP)
                                                                                        BISB    TMP6+1,(SP)
                                                                                        CLR     -(SP)
                                                                                        BISB    TMP7+1,(SP)
                                                                                        CLR     -(SP)
                                                                                        BISB    TMP4+1,(SP)
                                                                                        CLR     -(SP)
                                                                                        BISB    TMP5+1,(SP)
                                                                                        MOV     #TXT8D,-(SP)
                                                                                        MOV     #FMT50C,-(SP)
                                                                                        MOV     #6,-(SP)
                                                                                        MOV     SP,R0
                                                                                        TRAP    C$PNTX
                                                                                        ADD     #16,SP
                                PRINTX  #FMT50D,<B,TMPB+1>,<B,TMPE+1>
                                                                                        CLR     -(SP)
                                                                                        BISB    TMPE+1,(SP)
                                                                                        CLR     -(SP)
```

```
3229
3230
3231
3232
3233
3234
3235  010762
3236  010762
3237  010762  010146
3238  010764  113701  002467
3239  010770  000241
3240
3241  010772  042701  177477
3242  010776  106101
3243  011000  106101
3244  011002  106101
3245
3246
3247
3248  011004
3249  011004  010146
3250  011006  012746  012747
3251  011012  012746  000002
3252  011016  010600
3253  011020  104415
3254  011022  062706  000006
3255
3256
3257  011026
3258  011026  012746  013021
3259  011032  012746  000001
3260  011036  010600
3261  011040  104415
3262  011042  062706  000004
3263
3264
3265  011046
3266  011046  005046
3267  011050  153716  002455
3268  011054  005046
3269  011056  153716  002457
3270  011062  005046
3271  011064  153716  002451
3272  011070  005046
3273  011072  153716  002453
3274  011076  012746  014053
3275  011102  012746  013102
3276  011106  012746  000006
3277  011112  010600
3278  011114  104415
3279  011116  062706  000016
3280  011122
3281  011122  005046
3282  011124  153716  002475
3283  011130  005046
```

```
3284  011132  153716  002467                                                  BISB    TMPB+1,(SP)
3285  011136  012746  013142                                                  MOV     #FMT50D,-(SP)
3286  011142  012746  000003                                                  MOV     #3,-(SP)
3287  011146  010600                                                          MOV     SP,R0
3288  011150  104415                                                          TRAP    C$PNTX
3289  011152  062706  000010                                                  ADD     #10,SP
3290                          ;AND THE VALUES READ FROM THOSE REGISTERS:
3291
3292  011156                  PRINTX  #FMT50C,#TXT8E,<B,TMP5>,<B,TMP4>,<B,TMP7>,<B,TMP6>
3293  011156  005046                                                          CLR     -(SP)
3294  011160  153716  002454                                                  BISB    TMP6,(SP)
3295  011164  005046                                                          CLR     -(SP)
3296  011166  153716  002456                                                  BISB    TMP7,(SP)
3297  011172  005046                                                          CLR     -(SP)
3298  011174  153716  002450                                                  BISB    TMP4,(SP)
3299  011200  005046                                                          CLR     -(SP)
3300  011202  153716  002452                                                  BISB    TMP5,(SP)
3301  011206  012746  014070                                                  MOV     #TXT8E,-(SP)
3302  011212  012746  013102                                                  MOV     #FMT50C,-(SP)
3303  011216  012746  000006                                                  MOV     #6,-(SP)
3304  011222  010600                                                          MOV     SP,R0
3305  011224  104415                                                          TRAP    C$PNTX
3306  011226  062706  000016                                                  ADD     #16,SP
3307  011232                  PRINTX  #FMT50E,<B,TMPB>,<B,TMPD>
3308  011232  005046                                                          CLR     -(SP)
3309  011234  153716  002472                                                  BISB    TMPD,(SP)
3310  011240  005046                                                          CLR     -(SP)
3311  011242  153716  002466                                                  BISB    TMPB,(SP)
3312  011246  012746  013157                                                  MOV     #FMT50E,-(SP)
3313  011252  012746  000003                                                  MOV     #3,-(SP)
3314  011256  010600                                                          MOV     SP,R0
3315  011260  104415                                                          TRAP    C$PNTX
3316  011262  062706  000010                                                  ADD     #10,SP
3317
3318  011266  004737  012072          JSR     PC,NULERR       ;USE COMMON ROUTINE TO TERMINATE ERROR MESSAGE
3319  011272  012601                  MOV     (SP)+,R1        ;RESTORE R1 FOR CALLER
3320  011274                  ENDMSG
3321  011274                                                          L10015:
3322  011274  104423                                                          TRAP    C$MSG
3323
3324
```

```
                                .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'

002310                  XORGB:  MOV     R1,-(SP)        ;PRESERVE WORKING REGISTER
002312                          MOV     GDATA,R1        ;GET 'GOOD' DATA
002314                          MOV     BDATA,XDATA     ;AND 'BAD' DATA
                                XOR     R1,XDATA        ;PERFORM EXCLUSIVE OR
                                MOV     (SP)+,R1        ;RESTORE R1
                                RTS     PC              ;RETURN


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

                        ERR4$:  PRINTX  #FMT4,#TXT3,#TXT1

                                                                MOV     #TXT1,-(SP)
                                                                MOV     #TXT3,-(SP)
                                                                MOV     #FMT4,-(SP)
                                                                MOV     #3,-(SP)
                                                                MOV     SP,R0
                                                                TRAP    C$PNTX
                                                                ADD     #10,SP

                        PRINTX  #FMT4A,<B,BSR0>,<B,BSR1>,<B,BSR2>,<B,BSR3>

                                                                CLR     -(SP)
                                                                BISB    BSR3,(SP)
                                                                CLR     -(SP)
                                                                BISB    BSR2,(SP)
                                                                CLR     -(SP)
                                                                BISB    BSR1,(SP)
                                                                CLR     -(SP)
                                                                BISB    BSR0,(SP)
                                                                MOV     #FMT4A,-(SP)
                                                                MOV     #5,-(SP)
                                                                MOV     SP,R0
                                                                TRAP    C$PNTX
                                                                ADD     #14,SP

                        PRINTX  #FMT4B,#TXT2

                                                                MOV     #TXT2,-(SP)
                                                                MOV     #FMT4B,-(SP)
                                                                MOV     #2,-(SP)
                                                                MOV     SP,R0
                                                                TRAP    C$PNTX
                                                                ADD     #6,SP

                        PRINTX  #FMT4C,<B,BSR4>,<B,BSR5>,<B,BSR6>,<B,BSR7>

                                                                CLR     -(SP)
                                                                BISB    BSR7,(SP)
```

```
3381  011454  005046                                    CLR     -(SP)
3382  011456  153716  002262                            BISB    BSR6,(SP)
3383  011462  005046                                    CLR     -(SP)
3384  011464  153716  002260                            BISB    BSR5,(SP)
3385  011470  005046                                    CLR     -(SP)
3386  011472  153716  002256                            BISB    BSR4,(SP)
3387  011476  012746  012345                            MOV     #FMT4C,-(SP)
3388  011502  012746  000005                            MOV     #5,-(SP)
3389  011506  010600                                    MOV     SP,R0
3390  011510  104415                                    TRAP    C$PNTX
3391  011512  062706  000014                            ADD     #14,SP
3392  011516                    PRINTX  #FMT4B,#TXT2A
3393  011516  012746  013353                            MOV     #TXT2A,-(SP)
3394  011522  012746  012340                            MOV     #FMT4B,-(SP)
3395  011526  012746  000002                            MOV     #2,-(SP)
3396  011532  010600                                    MOV     SP,R0
3397  011534  104415                                    TRAP    C$PNTX
3398  011536  062706  000006                            ADD     #6,SP
3399  011542                    PRINTX  #FMT4A,<B,BSR10>,<B,BSR11>,<B,BSR12>,<B,BSR13>
3400  011542  005046                                    CLR     -(SP)
3401  011544  153716  002274                            BISB    BSR13,(SP)
3402  011550  005046                                    CLR     -(SP)
3403  011552  153716  002272                            BISB    BSR12,(SP)
3404  011556  005046                                    CLR     -(SP)
3405  011560  153716  002270                            BISB    BSR11,(SP)
3406  011564  005046                                    CLR     -(SP)
3407  011566  153716  002266                            BISB    BSR10,(SP)
3408  011572  012746  012305                            MOV     #FMT4A,-(SP)
3409  011576  012746  000005                            MOV     #5,-(SP)
3410  011602  010600                                    MOV     SP,R0
3411  011604  104415                                    TRAP    C$PNTX
3412  011606  062706  000014                            ADD     #14,SP
3413  011612                    PRINTX  #FMT4B,#TXT2B
3414  011612  012746  013412                            MOV     #TXT2B,-(SP)
3415  011616  012746  012340                            MOV     #FMT4B,-(SP)
3416  011622  012746  000002                            MOV     #2,-(SP)
3417  011626  010600                                    MOV     SP,R0
3418  011630  104415                                    TRAP    C$PNTX
3419  011634  062706  000006                            ADD     #6,SP
3420  011640                    PRINTX  #FMT4C,<B,BSR14>,<B,BSR15>,<B,BSR16>,<B,BSR17>
3421  011636  005046                                    CLR     -(SP)
3422  011640  153716  002304                            BISB    BSR17,(SP)
3423  011644  005046                                    CLR     -(SP)
3424  011646  153716  002302                            BISB    BSR16,(SP)
3425  011652  005046                                    CLR     -(SP)
3426  011654  153716  002300                            BISB    BSR15,(SP)
3427  011660  005046                                    CLR     -(SP)
3428  011662  153716  002276                            BISB    BSR14,(SP)
3429  011666  012746  012345                            MOV     #FMT4C,-(SP)
3430  011672  012746  000005                            MOV     #5,-(SP)
3431  011676  010600                                    MOV     SP,R0
3432  011700  104415                                    TRAP    C$PNTX
3433  011702  062706  000014                            ADD     #14,SP
3434  011706  000207            RTS     PC
3435
3436                ;-----------------------------------------------------------------
```

```
3437
3438
3439
3440  011710                        .....ERROR HANDLER SUBROUTINE -- ERR5$
3441  011710                        .SBTTL .....ERROR HANDLER SUBROUTINE -- ERR5$
3442  011710  012746  013504        ;-----------------------------------------------------------
3443  011714  012746  013607        ;
3444  011720  012746  012245        ;       COMMON ERROR SUBROUTINE TO PRINT SELECT REGISTERS
3445  011724  012746  000003        ERR5$:
3446  011730  010600                        PRINTX  #FMT4,#TXT6,#TXT4
3447  011732  104415                                                        MOV     #TXT4,-(SP)
3448  011734  062706  000010                                               MOV     #TXT6,-(SP)
3449  011740                                                                MOV     #FMT4,-(SP)
3450  011740  013746  002254                                               MOV     #3,-(SP)
3451  011744  013746  002252                                               MOV     SP,R0
3452  011750  013746  002250                                               TRAP    C$PNTX
3453  011754  013746  002246                                               ADD     #10,SP
3454  011760  012746  012730        ;       PRINTX  #FMT11,WSR0,WSR2,WSR4,WSR6 ;DUMP THE SELECT REGISTERS
3455  011764  012746  000005                                               MOV     WSR6,-(SP)
3456  011770  010600                                                       MOV     WSR4,-(SP)
3457  011772  104415                                                       MOV     WSR2,-(SP)
3458  011774  062706  000014                                               MOV     WSR0,-(SP)
3459  012000                                                                MOV     #FMT11,-(SP)
3460  012000  012746  013544                                               MOV     #5,-(SP)
3461  012004  012746  012340                                               MOV     SP,R0
3462  012010  012746  000002                                               TRAP    C$PNTX
3463  012014  010600                                                       ADD     #14,SP
3464  012016  104415                        PRINTX  #FMT4B,#TXT4A
3465  012020  062706  000006                                               MOV     #TXT4A,-(SP)
3466  012024                                                                MOV     #FMT4B,-(SP)
3467  012024  013746  002264                                               MOV     #2,-(SP)
3468  012030  013746  002262                                               MOV     SP,R0
3469  012034  013746  002260                                               TRAP    C$PNTX
3470  012040  013746  002256                                               ADD     #6,SP
3471  012044  012746  012730        ;       PRINTX  #FMT11,WSR10,WSR12,WSR14,WSR16
3472  012050  012746  000005                                               MOV     WSR16,-(SP)
3473  012054  010600                                                       MOV     WSR14,-(SP)
3474  012056  104415                                                       MOV     WSR12,-(SP)
3475  012060  062706  000014                                               MOV     WSR10,-(SP)
3476  012064  004737  012072                                               MOV     #FMT11,-(SP)
3477  012070  000207                                                       MOV     #5,-(SP)
3478                                                                        MOV     SP,R0
3479                                                                        TRAP    C$PNTX
3480                                                                        ADD     #14,SP
3481                                        JSR     PC,NULERR       ;USE COMMON ROUTINE TO TERMINATE ERROR MESSAGE
3482  012072                                RTS     PC
3483  012072  012746  012114        ;-----------------------------------------------------------
3484  012076  012746  000001        ;
3485  012102  010600                ;       SUBROUTINE TO PERFORM 'PRINTB   #ENDEMB'
3486  012104  104414
3487  012106  062706  000004        NULERR: PRINTB  #ENDEMB         ;TERMINATE ERROR MESSAGE
3488  012112  000207                                                        MOV     #ENDEMB,-(SP)
3489                                                                        MOV     #1,-(SP)
                                                                            MOV     SP,R0
                                                                            TRAP    C$PNTB
                                                                            ADD     #4,SP
                                        RTS     PC
                                ;-----------------------------------------------------------
```

```
3490                                    .SBTTL  FORMAT SPEC'S FOR ERROR HANDLERS -- 'FMT___''
3491                                    ;-----------------------------------------------------------------------
3492                                    ;---------- FORMAT SPEC'S USED BY ERROR HANDLERS ------------------------
3493                                    ;-----------------------------------------------------------------------
3494                                    .NLIST  BEX
     012114  047045  047045     000     ENDEMB: .ASCIZ  /%N%N/
     012121     045  000116             NEWLIN: .ASCIZ  /%N/

     012124  047045  040445  040506     FMT02:  .ASCIZ  /%N%AFAILING REG = %T%ASEL%02/
     012161     045  022516  020101     FMT02A: .ASCIZ  /%N%A  EXPECTED:  %03%A   ACTUAL:  %03%A   XOR:  %03/
     012245     045  022516  020101     FMT4:   .ASCIZ  /%N%A  THE CONTENTS OF ALL%T%N%T/
     012305     045  022516  030523     FMT4A:  .ASCIZ  /%N%S1%03%S5%03%S5%03%S5%03/
     012340  047045  052045     000     FMT4B:  .ASCIZ  /%N%T/
     012345     045  022516  032523     FMT4C:  .ASCIZ  /%N%S5%03%S5%03%S5%03%S5%03/
     012400  047045  040445  020040     FMT5:   .ASCIZ  /%N%A  WHEN %03%A LOADED INTO BSEL1/
     012443     045  022516  020101     FMT5A:  .ASCIZ  /%N%A  ATTEMPTING 'M-LOOP'' FUNCTION CODE %02%A (%T%A)/
     012530  040445  020040  042504     FMT07:  .ASCIZ  /%A  DETECTED IN %T%T%A --/
     012562  047045  047045  052045     FMT06:  .ASCIZ  /%N%N%T/
     012571     045  022516  022524     FMT06A: .ASCIZ  /%N%T%03%S2%03%S2%03%S2%03%S2%03%S2%03/
     012637     045  031123  047445     FMT06B: .ASCIZ  /%S2%03%S2%03/
     012654  047045  040445  020040     FMT10:  .ASCIZ  /%N%A  EXPECTED:%08%A  ACTUAL:%08%A  XOR:%08/
     012730  047045  047445  022470     FMT11:  .ASCIZ  /%N%08%08%08%08/
     012747     045  022516  020101     FMT50A: .ASCIZ  /%N%A  TIMER # 1 MODE:  %01%A   REGISTERS:/
     013021     045  022516  030523     FMT50B: .ASCIZ  /%N%S15%AT1CH  T1CL  T1LH  T1LL   ACR   IFR   IER/
     013102  047045  051445  022463     FMT50C: .ASCIZ  /%N%S3%T%S1%03%S3%03%S3%03%S3%03/
     013142  051445  022463  031517     FMT50D: .ASCIZ  /%S3%03%S9%03/
     013157     045  031523  047445     FMT50E: .ASCIZ  /%S3%03%S3%03/
     013174  047045  022462  030523     FMT50M: .ASCIZ  /%N2%S10%A(T1CH & T1CL HAVEN'T YET BEEN LOADED)/

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

     013253     102  042523  030114     TXT1:   .ASCIZ  /BSEL0   BSEL1   BSEL2   BSEL3/
     013311     040  020040  041040     TXT2:   .ASCIZ  /    BSEL4   BSEL5   BSEL6   BSEL7/
     013353     102  042523  030514     TXT2A:  .ASCIZ  /BSEL10  BSEL11  BSEL12  BSEL13/
     013412  020040  041040  042523     TXT2B:  .ASCIZ  /   BSEL14  BSEL15  BSEL16  BSEL17/
     013454  041040  052131  020105     TXT3:   .ASCIZ  / BYTE SELECT REG'S ARE:/
     013504  020040  051440  046105     TXT4:   .ASCIZ  /   SEL0    SEL2    SEL4    SEL6/
     013544  020040  051440  046105     TXT4A:  .ASCIZ  /   SEL10   SEL12   SEL14   SEL16/
     013605     102     000             TXT5:   .ASCIZ  /B/
     013607     040  042523  042514     TXT6:   .ASCIZ  / SELECT REG'S ARE:/
     013632  051040  043505  051511     TXT7:   .ASCIZ  / REGISTERS  ORB  ORA  DDRB DDRA T1CL T1CH T1LL T1LH /
     013717     040  020040  020040     TXT7A:  .ASCIZ  /                T2CL T2CH SR   ACR  PCR  IFR  IER  ORA  /
     014004  042440  050130  041505     TXT8A:  .ASCIZ  / EXPECTED:  /
     014021     040  041501  052524     TXT8B:  .ASCIZ  / ACTUAL:    /
     014036  054040  051117  020072     TXT8C:  .ASCIZ  / XOR:       /
     014053     040  047514  042101     TXT8D:  .ASCIZ  / LOADED:    /
     014070  051040  040505  035104     TXT8E:  .ASCIZ  / READ:      /

     014105     116  050117     000     TXTML0: .ASCIZ  /NOP/
     014111     122  040505  020104     TXTML1: .ASCIZ  /READ 1 BYTE/
     014125     127  044522  042524     TXTML2: .ASCIZ  /WRITE 1 BYTE/
     014142  050116  026522  052517     TXTML3: .ASCIZ  /NPR-OUT 256 BYTES/
     014164  050116  026522  047111     TXTML4: .ASCIZ  /NPR-IN 256 BYTES/
```

```
014205     123  052105  046440  TXTML5: .ASCIZ  /SET MICROPROCESSOR'S PC/
014235     125  042116  043105  TXTML6: .ASCIZ  /UNDEFINED/
014247     123  052105  046440  TXTML7: .ASCIZ  /SET MAINT INTR & CLR INTR DISABLE IN CPU STATUS/

014327     126  040511  051040  TXTVR:  .ASCIZ  /VIA REGISTER /
014345     117  041122     000  TXTVR0: .ASCIZ  /ORB/
014351     117  040522     000  TXTVR1: .ASCIZ  /ORA/
014355     104  051104  000102  TXTVR2: .ASCIZ  /DDRB/
014362  042104  040522     000  TXTVR3: .ASCIZ  /DDRA/
014367     124  041461  000114  TXTVR4: .ASCIZ  /T1CL/
014374  030524  044103     000  TXTVR5: .ASCIZ  /T1CH/
014401     124  046061  000114  TXTVR6: .ASCIZ  /T1LL/
014406  030524  044114     000  TXTVR7: .ASCIZ  /T1LH/
014413     124  041462  000114  TXTVR8: .ASCIZ  /T2CL/
014420  031124  044103     000  TXTVR9: .ASCIZ  /T2CH/
014425     123  000122          TXTVRA: .ASCIZ  /SR/
014430  041501  000122          TXTVRB: .ASCIZ  /ACR/
014434  041520  000122          TXTVRC: .ASCIZ  /PCR/
014440  043111  000122          TXTVRD: .ASCIZ  /IFR/
014444  042511  000122          TXTVRE: .ASCIZ  /IER/
014450  051117  000101          TXTVRF: .ASCIZ  /ORA/
```

```
                        .SBTTL  ERROR MESSAGES -- 'EM___'
                        ;*****************************************************************
                        ;********** ERROR MESSAGES USED BY ERROR CALL'S **********
                        ;*****************************************************************

014454 044515 051103 026517 EM3:    .ASCIZ  /MICRO-DIAG. FAILURE/
014500 051115 054504 052040 EM4:    .ASCIZ  /MRDY TIMEOUT/
014515    115 051501 042524 EM5:    .ASCIZ  /MASTER CLR FAILURE/
014540 051503 020122 042101 EM6:    .ASCIZ  /CSR ADDRESS FAILURE/
014564 051503 020122 040504 EM7:    .ASCIZ  /CSR DATA PAT FAILURE/
014611    102 042523 030114 EM8:    .ASCIZ  /BSEL0 SET=ALL ONES/
014634 054105 042524 047122 EM9:    .ASCIZ  /EXTERNAL BUS RESET FAILURE/
014657    102 042101 041440 EM14:   .ASCIZ  /BAD CSR VALUE(S) AFTER MASTER CLEAR/
014733    042 051115 054504 EM15:   .ASCIZ  /'MRDY' DIDN'T GO LOW WHILE PROCESSING A COMMAND/
015013    104 053115 051447 EM16:   .ASCIZ  /DMV'S RAM LOC. (CORRESPONDING TO BSEL0) NOT PROPERLY WRITTEN/
015110 032466 031060 053440 EM17:   .ASCIZ  /6502 WRITE FUNC. FAILURE AFTER 'RUN' BIT IS SET/
015170 032466 031060 051440 EM17A:  .ASCIZ  /6502 STILL RUNNING AFTER 'RUN' BIT CLEARED/
015243    126 040511 051440 EM20:   .ASCIZ  /VIA STATIC REGISTER ERROR/
015275    126 040511 051440 EM20A:  .ASCIZ  /VIA STATIC REGISTER ERROR -- TIMMER NOT RUNNING/
015355    126 040511 051440 EM20B:  .ASCIZ  /VIA STATIC REGISTER ERROR -- TIMMER CROSS TALK ERROR/
015442 042522 044507 052123 EM21:   .ASCIZ  /REGISTER NOT PROPERLY ZEROED/
015477    132 051105 044517 EM22:   .ASCIZ  /ZEROING DDRB EFFECTED DDRA/
015532 042532 047522 047111 EM22A:  .ASCIZ  /ZEROING DDRA EFFECTED DDRB/
015565    122 040505 027504 EM25:   .ASCIZ  'READ/WRITE DATA ERROR'
015613    125 042516 050130 EM34:   .ASCIZ  /UNEXPECTED 'A' INTERRUPT/
015644 047125 054105 042520 EM34B:  .ASCIZ  /UNEXPECTED 'B' INTERRUPT/
015675    122 046501 042040 EM47A:  .ASCIZ  /RAM DATA ERROR ON INITIAL WRITE/
015735    122 046501 042040 EM47B:  .ASCIZ  /RAM DATA ERROR ON RE-READ AFTER TEST AREA FILLED/
016016 040522 020115 040504 EM48A:  .ASCIZ  /RAM DATA ERROR -- MOVING INVERSIONS TEST/
016067    042 030524 020042 EM50A:  .ASCIZ  \'T1' FLAG NOT CLEARED BY LOADING T1LH\
016135    042 030524 020042 EM50B:  .ASCIZ  \'T1' FLAG NOT CLEARED BY LOADING T1CH\
016203    042 030524 020042 EM50C:  .ASCIZ  \'T1' FLAG NOT CLEARED BY READING T1CL\
016251    126 040511 051447 EM50D:  .ASCIZ  \VIA'S T1CL NOT DECREMENTING\
016305    126 040511 051447 EM50E:  .ASCIZ  \VIA'S T1CH NOT DECREMENTING\
016341    042 030524 020042 EM50F:  .ASCIZ  \'T1' FLAG NOT SET ON TIMER 1 TIMEOUT\
016406 052042 021061 043040 EM50G:  .ASCIZ  \'T1' FLAG CLEARED BY READING T1CH\
016450 044526 023501 020123 EM50H:  .ASCIZ  \VIA'S T1LL IMPROPERLY LOADED BY WRITING T1CL @ ADDR 4\
016536 052042 021061 043040 EM50I:  .ASCIZ  \'T1' FLAG CLEARED BY READING T1LL\
016600 044526 023501 020123 EM50J:  .ASCIZ  \VIA'S T1LH IMPROPERLY LOADED BY WRITING T1CH @ ADDR 5\
016666 052042 021061 043040 EM50K:  .ASCIZ  \'T1' FLAG CLEARED BY READING T1LH\
016730 052042 021061 043040 EM50L:  .ASCIZ  \'T1' FLAG NOT SET AFTER RE-LOADING T1CH & TIMEOUT\
017012 052042 021061 043040 EM50M:  .ASCIZ  \'T1' FLAG CLEARED BY LOADING T1LL\
017054 052042 021061 043040 EM50N:  .ASCIZ  \'T1' FLAG NOT CLEARED BY LOADING T1CH\
017122 050042 033502 020042 EM50S:  .ASCIZ  \'PB7' W/IN VIA NOT SET ON TIMER 1 TIMEOUT\
017174 050042 033502 020042 EM50U:  .ASCIZ  \'PB7' NOT SET AFTER TIMER 1 TIMEOUT\
017240 050042 033502 020042 EM50V:  .ASCIZ  \'PB7' NOT DRIVEN LOW BY LOADING T1CH\
017305    042 041120 021067 EM50W:  .ASCIZ  \'PB7' UNEXPECTEDLY MODIFIED BY TIMER 1\
017354 052042 021061 047040 EM50X:  .ASCIZ  \'T1' NOT RESET AFTER BEING CLEARED\
017417    042 041120 021067 EM50Y:  .ASCIZ  \'PB7' PREMATURELY SET DURING T1 COUNTDOWN\
017471    042 041120 021067 EM50Z:  .ASCIZ  \'PB7' NOT SET AFTER SECOND CYCLE\

                                    .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
```

```
3495                            .SBTTL LOAD DEVICE PROTECTION TABLE
3496
3497                            ;////////////////////////////////////////////////////////////////////////////////
3498                            ;/ THIS TABLE IDENTIFIES THE LOAD DEVICE TO THE SUPERVISOR, SO THAT IT CAN BE
3499                            ;/ PROTECTED FROM TESTING. IF DESIRED.
3500                            ;////////////////////////////////////////////////////////////////////////////////
3501
3502  017614                            BGNPROT
3503  017614                                                                  L$PROT::
3504  017614  177777                    .WORD   -1      ;DON'T CHK CSR ADRS
3505  017616  177777                    .WORD   -1      ;DON'T CHK MASSBUS UNIT NO.
3506  017620  177777                    .WORD   -1      ;DON'T CHK DRIVE NO.
3507  017622                            ENDPROT
```

```
3508
3509
3510                    .SBTTL INITIALIZE SECTION
3511
3512                    ;////////////////////////////////////////////////////////////////
3513                    ;/ THE INITIALIZE SECTION CONTAINS THE CODING THAT IS PERFORMED
3514                    ;/ AT THE BEGINNING OF THE TEST SEQUENCE ON THE NEXT UNIT.
3515                    ;////////////////////////////////////////////////////////////////
3516
3517 017622                     BGNINIT
3518 017622                                                          L$INIT::
3519
3520 017622 010637 002324       MOV     SP,PSTACK       ;SAVE BASE-LEVEL STACK POINTER
3521                     ;SEE IF PROGRAM JUST STARTED, BR IF YES
3522 017626             READEF  #EF.START
3523 017626 012700 000040                                                   MOV     #EF.START,R0
3524 017632 104447                                                          TRAP    C$REFG
3525 017634             BCOMPLETE       STARST
3526 017634 103417                                                          BCS     STARST
3527                    ;SEE IF PROGRAM JUST RESTARTED, BR IF YES
3528 017636             READEF  #EF.RESTART
3529 017636 012700 000037                                                   MOV     #EF.RESTART,R0
3530 017642 104447                                                          TRAP    C$REFG
3531 017644             BCOMPLETE       RESTRT
3532 017644 103435                                                          BCS     RESTRT
3533                    ;SEE IF THIS IS A NEW PASS, BR IF YES
3534 017646             READEF  #EF.NEW
3535 017646 012700 000035                                                   MOV     #EF.NEW,R0
3536 017652 104447                                                          TRAP    C$REFG
3537 017654             BCOMPLETE       NEWST
3538 017654 103433                                                          BCS     NEWST
3539                    ;SEE IF PROGRAM WAS JUST CONTINUED
3540 017656             READEF  #EF.CONTINUE
3541 017656 012700 000036                                                   MOV     #EF.CONTINUE,R0
3542 017662 104447                                                          TRAP    C$REFG
3543 017664             BCOMPLETE       10$
3544 017664 103401                                                          BCS     10$
3545 017666 000436              BR      GETPRM
3546
3547 017670 000137 020074       10$:    JMP     CONTIN          ;(THIS IS TO FAR AWAY FOR A 'BR'' INSTRUCTION)
3548
3549 017674                     STARST:         ;ENTER HERE IF 'START'' COMMAND ISSUED
3550
3551                    ; TEST FOR THE PRESENCE OR ABSENCE OF A CONSOLE TERMINAL.
3552
3553 017674 005037 002346       CLR     CONSOL          ;RESET THE CONSOLE TERMINAL FLAG
3554 017700             SETVEC  #4,#CONTST,#0   ;SETUP BUS TIMEOUT VECTER TO TEST FOR A CONSOLE
3555 017700 012746 000000                                                   MOV     #0,-(SP)
3556 017704 012746 020174                                                   MOV     #CONTST,-(SP)
3557 017710 012746 000004                                                   MOV     #4,-(SP)
3558 017714 012746 000003                                                   MOV     #3,-(SP)
3559 017720 104437                                                          TRAP    C$SVEC
3560 017722 062706 000010                                                   ADD     #10,SP
3561 017726 005737 177564       TST     @#177564        ;TRY TO ACCESS THE CONSOLE TERMINAL'S 'XCSR''
3562 017732             CLRVEC  #4              ;WE SHOULD BE THROUGH WITH THIS BY NOW
3563 017732 012700 000004                                                   MOV     #4,R0
3564 017736 104436                                                          TRAP    C$CVEC
3565
```

```
3564  017740                                  RESTRT:         ;ENTER HERE IF 'RESTART' COMMAND ISSUED
3565
3566                                          ;CLEAR DEVICE MAP
3567  017740  005037  002342                          CLR     DEVMAP
3568
3569  017744                                  NEWST:          ;ENTER HERE BEFORE EACH TEST
3570
3571  017744  012737  177777  002322                  MOV     #-1,LOGDEV      ;RESET LOGICAL DEVICE TO -1
3572  017752  005237  002340                          INC     FRSPAS          ;INCREMENT NO. OF PASSES AFTER LOAD
3573  017756  012737  000001  002344                  MOV     #BIT0,DEVPTR    ;INIT DEVICE MAP BIT POINTER
3574                                          ; GET UNIBUS ADDRESS, VECTOR, PRIORITY LEVEL, SWITCH PACKS, TEST
3575                                          ;   CONNECTOR INFORMATION FOR THIS LOGICAL DEVICE
3576  017764                                  GETPRM:
3577  017764  005237  002322                          INC     LOGDEV          ;INCREMENT LOGICAL DEVICE NUMBER
3578  017770                                          GPHARD  LOGDEV,R1       ;GET P-TABLE POINTER INTO R1
3579  017770  013700  002322                                                                  MOV     LOGDEV,R0
3580  017774  104442                                                                          TRAP    C$GPHRD
3581  017776  010001                                                                          MOV     R0,R1
3582  020000                                          BCOMPLETE  10$          ;BR IF DEVICE AVAILABLE
3583  020000  103403                                                                          BCS     10$
3584  020002  006337  002344                          ASL     DEVPTR          ;IF UN-AVAILABLE, SHIFT DEVICE MAP BIT POINTER
3585  020006  000766                                  BR      GETPRM          ;       AND SKIP THIS DEVICE
3586
3587  020010  053737  002344  002342  10$:     BIS     DEVPTR,DEVMAP   ;ELSE, SET BIT FOR THIS DEVICE IN DEVICE MAP
3588  020016  006337  002344                          ASL     DEVPTR          ;SHIFT DEVICE MAP BIT POINTER
3589
3590                                          ;  'R1' WAS RETURNED WITH A POINTER TO THE CURRENT 'P-TABLE'
3591
3592  020022  012100                                  MOV     (R1)+,R0        ;GET THE DEVICE CSR ADDRESS
3593  020024  012703  000020                          MOV     #16.,R3         ;WE HAVE TO SETUP THIS MANY ADDRESS POINTERS
3594  020030  012702  002352                          MOV     #MPCSR,R2       ;THIS IS THE ADDRESS OF THE FIRST POINTER
3595  020034  010022                          12$:    MOV     R0,(R2)+        ;SETUP ONE CSR POINTER
3596  020036  005200                                  INC     R0              ;POINT TO THE NEXT CSR ADDRESS
3597  020040  077303                                  SOB     R3,12$          ;LOOP AS LONG AS THERE ARE MORE TABLE ENTRIES
3598                                                                          ;ELSE,  FALL THROUGH TO CONTINUE GETTING MORE
3599                                                                          ;       P-TABLE DATA
3600
3601  020042  012100                                  MOV     (R1)+,R0        ;GET INTERRUPT VECTOR
3602  020044  010037  002412                          MOV     R0,MPIVEC       ;SETUP 'A' VECTOR POINTER
3603  020050  022020                                  CMP     (R0)+,(R0)+     ;ADD 4 TO VECTOR TO GET ADDRESS OF 'B' VECTOR
3604  020052  010037  002414                          MOV     R0,MPOVEC       ;SETUP 'B' VECTOR POINTER
3605
3606  020056  012100                                  MOV     (R1)+,R0        ;GET DMV11 DEVICE PRIORITY
3607  020060  006200                                  ASR     R0              ;       RE-POSITION it
3608  020062  006200                                  ASR     R0
3609  020064  006200                                  ASR     R0
3610  020066  006200                                  ASR     R0
3611  020070  010037  002416                          MOV     R0,MPRIOR       ;SETUP OUR VARIABLE FOR INT. VECTOR INIT'S
3612
3613  020074                                  CONTIN:         ;ENTER HERE WHEN A 'CONTINUE' COMMAND IS ISSUED
3614
3615  020074                                          SETVEC  @#MPIVEC,#MPIHAN,@#MPRIOR  ;SETUP 'A' INT. VECTOR
3616  020074  013746  002416                                                                  MOV     @#MPRIOR,-(SP)
3617  020100  012746  005152                                                                  MOV     #MPIHAN,-(SP)
3618  020104  013746  002412                                                                  MOV     @#MPIVEC,-(SP)
3619  020110  012746  000003                                                                  MOV     #3,-(SP)
```

```
3620  020114  104437                                                          TRAP    C$SVEC
3621  020116  062706  000010                                                  ADD     #10,SP
3622  020122  005037  005222          CLR     IHILNK          ;WE DON'T WANT THE HANDLER TO LINK ELSEWHERE
3623  020126                         SETVEC  @#MPOVEC,#MPOHAN,@#MPRIOR  ;SETUP 'B' INT. VECTOR
3624  020126  013746  002416                                                  MOV     @#MPRIOR,-(SP)
3625  020132  012746  005224                                                  MOV     #MPOHAN,-(SP)
3626  020136  013746  002414                                                  MOV     @#MPOVEC,-(SP)
3627  020142  012746  000003                                                  MOV     #3,-(SP)
3628  020146  104437                                                          TRAP    C$SVEC
3629  020150  062706  000010                                                  ADD     #10,SP
3630  020154  005037  005274          CLR     IHOLNK          ;WE DON'T WANT THE HANDLER TO LINK ELSEWHERE
3631  020160  005037  002330          CLR     INTWCH          ;RESET ''INTERRUPT WATCH'' FLAGS (BOTH ''A'' & 'B')
3632
3633  020164  012737  000001  002336  MOV     #1,FRSTIM       ;MARK FLAG FOR NEXT TIME THROUGH
3634  020172                         ENDINIT         ;END OF ''INIT'' CODE
3635  020172                                                          L10017:
3636  020172  104411                                                          TRAP    C$INIT
3637
3638                                 ; ***** SUBROUTINES USED BY ''INIT'' CODE *****
3639
3640                                 ;       INTERRUPT HANDLER FOR CONSOLE TERMINAL PRESENCE TESTING
3641
3642  020174  012737  177777  002346  CONTST: MOV     #-1,CONSOL      ;INDICATE THAT NO CONSOLE TERMINAL EXISTS!
3643  020202  000002                  RTI                     ;RETURN
3644
```

```
3645
3646
3647
3648
3649
3650
3651
3652
3653
3654
3655
3656
3657
3658
3659
3660
3661  020204                                .SBTTL AUTO DROP UNIT SECTION
3662  020204
3663  020204                                ;////////////////////////////////////////////////////////////////////////
3664  020204                                ;/ THE AUTO DROP CODING DETERMINES WHETHER OR NOT THE DEVICE WHOSE P-TABLE
3665  020204                                ;/ WAS JUST OBTAINED IS READY FOR TESTING, AND IT IS DROPPED IF NOT READY.
3666  020204                                ;////////////////////////////////////////////////////////////////////////
3667  020204
3668  020204                                ;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
3669  020204                                ;
3670  020204                                ;       THIS ALGORITHM IS THE SAME AS TEST # 1 EXCEPT THAT TEST 1
3671  020204                                ;       WILL JUST REPORT THE FAILURE AND GO ON -- THIS ROUTINE WILL CAUSE THE
3672  020204                                ;       DEVICE TO BE DROPPED IF A BUS-TIMEOUT OCCURS WHEN ANY OF THE CSR'S
3673  020204                                ;       ARE ACCESSED WITH EITHER A ''TST'' OR ''TSTB'' INSTRUCTION.
3674  020204                                ;
3675  020204                                ;---------------------------------------------------------------------------
3676  020204                                        BGNAUTO
3677  020204                                                                                L$AUTO::
3678  020204  012746  000000                        SETVEC  #4,#AD.HIT,#0   ;SETUP INVALID-ADDRESS TRAP VECTOR
3679  020210  012746  020322                                                                MOV     #0,-(SP)
3680  020214  012746  000004                                                                MOV     #AD.HIT,-(SP)
3681  020220  012746  000003                                                                MOV     #4,-(SP)
3682  020224  104437                                                                        MOV     #3,-(SP)
3683  020226  062706  000010                                                                TRAP    C$SVEC
3684  020232  005037  002440                                                                ADD     #10,SP
3685  020236  012702  000001                        CLR     TMP0            ;INITIALIZE TRAP FLAG REGISTER
3686  020242  013703  002352                        MOV     #1,R2           ;FLAG BIT
3687  020246  105723                        1$:     MOV     BSEL0,R3        ;INIT ADDRESS POINTER
3688  020250  006302                                TSTB    (R3)+           ;ACCESS THE CSR'S BY BYTES.
3689  020252  103375                                ASL     R2
3690  020254  013703  002352                        BCC     1$
3691  020260  012702  000001                        MOV     BSEL0,R3        ;RE-INIT ADDRESS POINTER
3692  020264  005723                        2$:     MOV     #1,R2           ;RE-INIT FLAG BIT
3693  020266  006302                                TST     (R3)+           ;ACCESS THE CSR'S BY WORDS.
3694  020270  006302                                ASL     R2
3695  020272  103374                                ASL     R2
3696  020274                                        BCC     2$
3697  020274  012700  000004                        CLRVEC  #4              ;RESTORE THE VECTOR TO DS
3698  020300  104436                                                                        MOV     #4,R0
3699  020302  005737  002440                                                                TRAP    C$CVEC
3700  020306  001403                                TST     TMP0            ;DID WE GET HIT WITH AN INVAL'D ADDRESS TRAP?
3701  020310                                        BEQ     AD.OK           ;NO,  EXIT TEST
3702  020310  013700  002322                        DODU    LOGDEV          ;YES, DROP THIS LOGICAL DEV.
3703  020314  104451                                                                        MOV     LOGDEV,R0
3704  020316  000240                                                                        TRAP    C$DODU
3705  020320                                AD.OK:  NOP                     ;(FOR PATCHING IN A HALT IF NECESSARY)
3706  020320                                        ENDAUTO
3707  020320                                                                        L10020:
3708  020322  104461                                                                        TRAP    C$AUTO
3709  020326  050237  002440                AD.HIT: BIS     R2,TMP0         ;FLAG THE HIT IF WE GET IT!
3710  020332  000002                                RTI                     ;RETURN
```

```
3699                                    .SBTTL CLEANUP CODING SECTION
3700
3701                                    ;////////////////////////////////////////////////////////////////////////
3702                                    ;/ THE CLEANUP CODING SECTION CONTAINS THE CODING THAT IS PERFORMED
3703                                    ;/ AT THE END OF THE TEST SEQUENCE ON A PARTICULAR UNIT.
3704                                    ;////////////////////////////////////////////////////////////////////////
3705
3706  020330                                    BGNCLN
3707  020330                                                                          L$CLEAN::
3708  020330                                    CLRVEC  @#MPIVEC        ;RETURN VECTORS TO SUPERVISOR
3709  020330  013700  002412                                                            MOV     @#MPIVEC,R0
3710  020334  104436                                                                    TRAP    C$CVEC
3711  020336                                    CLRVEC  @#MPOVEC
3712  020336  013700  002414                                                            MOV     @#MPOVEC,R0
3713  020342  104436                                                                    TRAP    C$CVEC
3714  020344                                    ENDCLN
3715  020344                                                                  L10021:
3716  020344  104412                                                                    TRAP    C$CLEAN
```

```
3717
3718
3719
3720
3721
3722
3723
3724   020346
3725   020346
3726
3727   020346
3728   020346  104433
3729   020350
3730   020350
3731   020350  104453
```

```
.SBTTL DROP UNIT SECTION

;////////////////////////////////////////////////////////////////////////////
;/ THE DROP-UNIT SECTION CONTAINS THE CODING THAT CAUSES A DEVICE
;/ TO NO LONGER BE TESTED.
;////////////////////////////////////////////////////////////////////////////

        BGNDU                                                   L$DU::

;ISSUE UNIBUS RESET TO CLEAN UP
        BRESET                                                          TRAP    C$RESET

        ENDDU                                                   L10022:
                                                                        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
                                                                        L$AU::
                                        ENDAU
                                                                        L10023:
020352  104452                                                                  TRAP    C$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
                                                                                T1::
020354
020354  005037  020520         CLR     T1.HSW          ;INITIALIZE TRAP FLAG REGISTER
020360  012702  000001         MOV     #1,R2           ;FLAG BIT FOR BYTE ACCESSED CSR 0.
020364  013703  002352         MOV     BSEL0,R3        ;INIT ADDRESS POINTER
020370                         SETVEC  #4,#T1 HIT,#0   ;SETUP INVALID-ADDRESS TRAP VECTOR
020370  012746  000000                                                          MOV     #0,-(SP)
020374  012746  020512                                                          MOV     #T1.HIT,-(SP)
020400  012746  000004                                                          MOV     #4,-(SP)
020404  012746  000003                                                          MOV     #3,-(SP)
020410  104437                                                                  TRAP    C$SVEC
020412  062706  000010                                                          ADD     #10,SP

020416  105723          1$:     TSTB    (R3)+           ;ACCESS THE CSR'S BY BYTES.
020420  006302                  ASL     R2
020422  103375                  BCC     1$

020426  013737  020520  020522          MOV     T1.HSW,T1.HSB   ;MOVE BYTE INTERRUPT FLAG TO PROPER LOCATION.
020432  005037  020520                  CLR     T1.HSW          ;INITIALIZE TRAP FLAG REGISTER
020436  012702  000001                  MOV     #1,R2           ;FLAG BIT FOR WORD ACCESSED CSR 0.
020442  013703  002352                  MOV     BSEL0,R3        ;RE-INIT ADDRESS POINTER

020446  005723          2$:     TST     (R3)+           ;ACCESS THE CSR'S BY WORDS.
020450  006302                  ASL     R2
020452  006302                  ASL     R2
020454  103374                  BCC     2$

020456                          CLRVEC  #4              ;RESTORE THE VECTOR TO DS
020456  012700  000004                                                          MOV     #4,R0
020462  104436                                                                  TRAP    C$CVEC
020464  005737  020520                  TST     T1.HSW          ;DID WE GET AN INVALID ADDRESS TRAP?
020470  001003                  BNE     3$              ;YES, REPORT FAILURE
020472  005737  020522                  TST     T1.HSB
020476  001404                  BEQ     T1.OK
020500          3$:     GEDF    T1.EHD,T1.EM1   ;YES, REPORT THE ERROR
```

```
3801
3802  020500  104455                                ;       'DEVICE FATAL'' ERROR # 9
3803  020502  000011                                                        TRAP    C$ERDF
3804  020504  020642                                                        .WORD   9
3805  020506  020524                                                        .WORD   T1.EHD
3806  020510                                        T1.OK:  ENDTST          .WORD   T1.EM1
3807  020510                                                          L10024:
3808  020510  104401                                                        TRAP    C$ETST
3809
3810  020512  050237  020520                        T1.HIT: BIS     R2,T1.HSW       ;FLAG THE HIT IF WE GET IT!
3811  020516  000002                                        RTI                     ;RETURN
3812
3813  020520  000000                                T1.HSW: .WORD   0               ;INVALID ADDRESS TRAP FLAG WORD:
3814                                                                                ;BITS SET INDICATE TRAPS ON WORD ACCESSES
3815                                                                                ;(BIT # SET = CSR # THAT FAILED)
3816  020522  000000                                T1.HSB: .WORD   0               ;INVALID ADDRESS TRAP FLAG WORD:
3817                                                                                ;BITS SET INDICATE TRAPS ON BYTE ACCESSES
3818                                                                                ;(BIT # SET = CSR # THAT FAILED)
3819  020524                                                BGNMSG  T1.EM1
3820  020524                                                                                  T1.EM1::
3821  020524                                                PRINTB  #T1.1,MPCSR     ;IDENTIFY ERROR AND ON WHAT DEVICE
3822  020524  013746  002352                                                                  MOV     MPCSR,-(SP)
3823  020530  012746  020671                                                                  MOV     #T1.1,-(SP)
3824  020534  012746  000002                                                                  MOV     #2,-(SP)
3825  020540  010600                                                                          MOV     SP,R0
3826  020542  104414                                                                          TRAP    C$PNTB
3827  020544  062706  000006                                                                  ADD     #6,SP
3828  020550                                                PRINTX  #T1.2           ;IF REQUESTED, ALSO INDICATE MISSES (TRAPS)
3829  020550  012746  020753                                                                  MOV     #T1.2,-(SP)
3830  020554  012746  000001                                                                  MOV     #1,-(SP)
3831  020560  010600                                                                          MOV     SP,R0
3832  020562  104415                                                                          TRAP    C$PNTX
3833  020564  062706  000004                                                                  ADD     #4,SP
3834  020570                                                PRINTX  #T1.3
3835  020570  012746  021006                                                                  MOV     #T1.3,-(SP)
3836  020574  012746  000001                                                                  MOV     #1,-(SP)
3837  020600  010600                                                                          MOV     SP,R0
3838  020602  104415                                                                          TRAP    C$PNTX
3839  020604  062706  000004                                                                  ADD     #4,SP
3840  020610                                                PRINTX  #T1.4,T1.HSW,T1.HSB
3841  020610  013746  020522                                                                  MOV     T1.HSB,-(SP)
3842  020614  013746  020520                                                                  MOV     T1.HSW,-(SP)
3843  020620  012746  021060                                                                  MOV     #T1.4,-(SP)
3844  020624  012746  000003                                                                  MOV     #3,-(SP)
3845  020630  010600                                                                          MOV     SP,R0
3846  020632  104415                                                                          TRAP    C$PNTX
3847  020634  062706  000010                                                                  ADD     #10,SP
3848  020640                                                ENDMSG
3849  020640                                                                          L10025:
3850  020640  104423                                                                          TRAP    C$MSG
3851
3852                                        .NLIST  BEX
      020642  053101  044501  040514  T1.EHD: .ASCIZ  'AVAILABILITY TEST (#1)'
      020671     045  022516  042101  T1.1:   .ASCIZ  '%N%ADMV-11 @ %O%A NOT RESPONDING TO CSR ACCESSING'
      020753     045  031116  051445  T1.2:   .ASCIZ  '%N2%S21%ASEL #%S11%ABSEL #'
      021006  047045  051445  032461  T1.3:   .ASCIZ  '%N%S15%AE C A 8 6 4 2 0  FEDCBA9876543210'
```

```
CVDMAA.P11    12-DEC-80 15:59          TEST 1 -- DMV-11 AVAILABILITY

       021060  047045  022462  020101  T1.4:   .ASCIZ  '%N2%A   TRAP FLAGS:%B16%S2%B16'
                                       .LIST   BEX
  3853         021120                  .EVEN
```

```
                                .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
021120                                                                  T2::
                                ; ISSUE A MASTER CLEAR, AND DELAY FOR MICRO-DIAGNOSTICS TO COMPLETE BY CALLING
                                ; SUBROUTINE MASCLR.

021120  004737  003614                  JSR     PC,MASCLR       ; -ATTEMPT- TO RUN THE MICRO-DIAGNOSTIC
021124  103002                          BCC     8$              ;IF NO ERROR, PROCEED
021126                                  ERROR                   ;ELSE, REPORT IT AND
021126  104460                                                                  TRAP    C$ERROR
021130  000436                          BR      24$             ;       EXIT THIS TEST

                                        ; FIRST, INITIALIZE INDEX REGISTERS
021132  005001                  8$:     CLR     R1              ;R1 IS THE INDEX OF THE BYTE SELECT TABLE
021134  005002                          CLR     R2              ;R2 IS THE INDEX OF THE RESULTS TABLE
021136  016203  003040                  MOV     RESFMC(R2),R3   ;GET THE NUMBER OF PATTERNS IN RESULTS TABLE
021142  062702  000002                  ADD     #2,R2           ;MOVE POINTER TO NEXT BYTE
021146  126271  003040  002352  2$:     CMPB    RESFMC(R2),@BSEL(R1) ;COMPARE EXPECTED RESULTS WITH CSR'S.
021154  001005                          BNE     1$              ;A MISMATCH IS A DEVICE FATAL ERROR
021156  005202                          INC     R2              ;INCREMENT TABLE POINTER
021160  005201                          INC     R1              ;INCREMENT POINTER
021162  005201                          INC     R1              ;  BY 2  (WORD INCREMENT)

021164  077310                          SOB     R3,2$           ;CONTINUE TO LOOP THROUGH TABLE

021166  000417                          BR      24$             ;TEST COMPLETE WITH NO ERRORS, GO END TEST.

021170  017137  002352  002312  1$:     MOV     @BSEL(R1),BDATA ;GET DATA WORD THAT FAILED
021176  004737  004434                  JSR     PC,GETBSR       ;GET THE BSEL REGISTERS FOR DUMPING
021202  016237  003040  002310          MOV     RESFMC(R2),GDATA ;GET EXPECTED RESULT FROM TABLE
021210  006201                          ASR     R1              ;CONVERT WORD OFFSET TO BYTE CSR #
021212  010137  002334                  MOV     R1,REGNUM
021216                                  GEDF    EM14,ERR2       ;DEVICE FATAL ERROR, REPORT IT AND END TEST
                                                                ;       'DEVICE FATAL" ERROR # 10
021216  104455                                                                  TRAP    C$ERDF
021220  000012                                                                  .WORD   10
021222  014667                                                                  .WORD   EM14
```

```
3910  021224  005304
3911  021226
3912  021226
3913  021226  104401

24$:    ENDTST

                        .WORD   ERR2
L10026:
                        TRAP    C$ETST
```

```
                        .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
021230                                                                  T3::
                        ;-------------------------------------------------------------------------
                        ;       ******** DETAILED TEST DESCRIPTION ********
                        ; THIS TEST PROCEEDS AS FOLLOWS:
                        ;
                        ; (1) CLEAR ALL CSRS AND VERIFY SAME (CLEARING BSEL01 HALTS 6502)
                        ; (2) WRITE 01 INTO BSEL0; VERIFY BSEL0=01,ALL OTHERS=0
                        ; (3) WRITE 02 INTO BSEL1; VERIFY BSEL0=01,BSEL1=02,ALL OTHERS=0.
                        ; (4) WRITE 04 INTO BSEL2; VERIFY BSEL0=01,BSEL1=02,BSEL2=04,ALL OTHERS=0
                        ;
                        ; (5) => (17) CONTINUE TO INCREMENTALLY WRITE DATA-PATTERN-A INTO THE BSR'S,
                        ;               CHECKING ALL BSR'S AFTER EACH WRITE, UNTIL BSR'S COMPLETELY
                        ;               FILLED WITH DATA-PATTERN-A.
                        ; NOTE: IF AN ERROR OCCURS, THE FIRST BAD BSR NUMBER AND GOOD/BAD VALUES ARE
                        ;       GIVEN, FOLLOWED BY A COMPLETE BSR DUMP.
                        ;-------------------------------------------------------------------------
                        ;
                        ; CLEAR DMV CSRS AND RESULTS TABLE
                        ;
021230  012703  000010          MOV     #10,R3          ;GET # OF CSRS
021234  013701  002352          MOV     @#BSEL,R1       ;GET 1ST CSR ADDRESS
021240  012702  003062          MOV     #RESFT3,R2      ;GET 1ST RESULTS TABLE ADDRESS
021244  005021          1$:     CLR     (R1)+           ;CLEAR CSR, BUMP POINTER
021246  005022                  CLR     (R2)+           ;CLEAR RESULTS TABLE LOC., BUMP POINTER
021250  005022                  CLR     (R2)+           ; AND DO AGAIN
021252  077304                  SOB     R3,1$           ;LOOP UNTIL ALL DONE
                        ;
                        ; NOW VERIFY CSRS ARE ALL ZEROED
                        ;
021254  005002                  CLR     R2              ;CLEAR BSR ADDRESS INDEX
021256  012703  000020          MOV     #CSREGS,R3      ;GET # OF CSRS
021262  105772  002352  2$:     TSTB    @BSEL(R2)       ;IS THIS CSR=0 ?
021266  001035                  BNE     5$              ;IF NO: GO REPORT ERROR
021270  005722                  TST     (R2)+           ;  YES: BUMP INDEX
021272  077305                  SOB     R3,2$           ;DO UNTIL ALL BSRS CHECKED
                        ;
                        ;=========================================================================
                        ;
                        ;       ; INITIALIZE INDEX REGISTERS
021274  005001                  CLR     R1              ;INITIALIZE PATTERN INDEX REGISTER
```

```
3970  021276  012703  000020                MOV     #CSREGS,R3      ;GET NUMBER OF CSR'S
3971
3972                                        ; THE FIRST WORD OF THE DATA TABLE CONTAINS THE NUMBER OF PATTERNS IN
3973                                        ; THE TABLE:
3974  021302  016104  002504                MOV     PATA(R1),R4     ;INITIALIZE NUMBER OF PATTERNS COUNT
3975  021306  005721                        TST     (R1)+           ;MOVE TABLE POINTER
3976
3977                                    ; PUT NEXT PATTERN OF DATA INTO NEXT REGISTER AND TEST AREA:
3978                                    ;
3979                                    ;  CALCULATE INDEX INTO DATA AREA AND TO REGISTER
3980
3981  021310  010102                3$:     MOV     R1,R2           ;GET INDEX INTO TEST DATA AREA
3982  021312  005742                        TST     -(R2)           ;IT'S ONE WORD TOO LARGE
3983  021314  006302                        ASL     R2              ;CONVERT FROM BYTE TO WORD INDEX
3984
3985                                    ;  NOW, SETUP THE EXPECTED RESULTS AREA AND LOAD THE SELECT REGISTER
3986
3987  021316  116162  002504  003062        MOVB    PATA(R1),RESFT3(R2) ;UPDATE THE EXPECTED RESULTS TABLE
3988  021324  116172  002504  002352        MOVB    PATA(R1),@BSEL(R2) ;PUT PATTERN INTO THE CSR
3989
3990  021332  005201                        INC     R1              ;BUMP DATA POINTER FOR NEXT TIME AROUND
3991  021334  005002                        CLR     R2              ;INITIALIZE TABLE INDEX
3992  021336  012703  000020                MOV     #CSREGS,R3      ;INITIALIZE NUMBER OF REGISTERS
3993
3994  021342  126272  003062  002352  4$:   CMPB    RESFT3(R2),@BSEL(R2) ;COMPARE CSR WITH RESULTS TABLE
3995  021350  001004                        BNE     5$              ;A MISMATCH IS A DEVICE FATAL ERROR
3996  021352  005722                        TST     (R2)+           ;BUMP TABLE POINTER BY 2  (WORD INCREMENT)
3997  021354  077306                        SOB     R3,4$           ;CONTINUE TO READ & MATCH ALL REGISTERS BEFORE
3998                                                                ;LOADING THE NEXT PATTERN INTO NEXT REGISTER
3999
4000  021356  077424                        SOB     R4,3$           ;LOOP UNTIL ALL PATTERNS ARE TESTED
4001  021360  000417                        BR      24$             ;TEST COMPLETE **<< NO ERRORS >>**
4002
4003                                    ;--PREPARE THE FAILURE MESSAGE --
4004
4005  021362  016237  003062  002310  5$:   MOV     RESFT3(R2),GDATA ;GET THE EXPECTED RESULT FROM TABLE
4006  021370  017237  002352  002312        MOV     @BSEL(R2),BDATA ;GET THE FAILED WORD
4007  021376  004737  004434                JSR     PC,GETBSR       ;GET THE BSEL REGISTERS FOR DUMPING
4008  021402  006202                        ASR     R2              ;CONVERT WORD OFFSET TO BYTE CSR ADDRESS
4009  021404  010237  002334                MOV     R2,REGNUM       ;GET THE REGISTER THAT FAILED
4010  021410                                GEDF    EM6,ERR2        ;ERROR **** DEVICE FATAL ****
4011                                                                ;       'DEVICE FATAL'' ERROR # 11
4012  021410  104455                                                        TRAP    CSERDF
4013  021412  000013                                                        .WORD   11
4014  021414  014540                                                        .WORD   EM6
4015  021416  005304                                                        .WORD   ERR2
4016  021420                        24$:    ENDTST
4017  021420                                                        L10027:
4018  021420  104401                                                        TRAP    CSETST
```

```
                                .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
                                ;*
                                ;--++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                                ;
                                        BGNTST
                                                                                T4::
021422
021422  004737  003762                  JSR     PC,@MSTCLR      ;CALL MAINTENANCE READY INITIALIZATION. IF
                                                                ;MSTCLR SHOULD FAIL BECAUSE THE MRDY FLAG DOES
                                                                ;NOT BECOME SET, A DEVICE FATAL ERROR WILL BE
                                                                ;REPORTED, AND MSTCLR WILL SET THE 'C'' BIT
021426  103002                          BCC     8$              ;IF NO ERROR, PROCEED
021430                                  ERROR                   ;ELSE, REPORT IT AND
021430  104460                                                                  TRAP    C$ERROR
021432  000453                          BR      24$             ;       EXIT THIS TEST
                                ;
                                ;  NOTE - THE FIRST BYTE LOCATION OF THE PATTERN B TABLE, USED IN THIS TEST,
                                ;         CONTAINS THE NUMBER OF TEST PATTERNS OF PATTERN B TABLE, NOT A
                                ;         TEST PATTERN.
                                ;
                                ; FIRST, INITIALIZE INDEX AND COUNT REGISTERS
                                ;
021434  005001                  8$:     CLR     R1              ;R1 IS THE 'PATB' INDEX REGISTER
021436  005002                          CLR     R2              ;R2 IS THE CSR INDEX REGISTER
021440  016103  002526                  MOV     PATB(R1),R3     ;R3 CONTAINS THE NUMBER OF BYTES IN PATB
021444  062702  000002                  ADD     #2,R2           ;MOVE POINTER TO FIRST BYTE OF DATA
                                ;
021450  113777  000101  160676          MOVB    101,@BSEL1      ;STOP THE MICRO-PROCESSOR!!!
                                ;
021456  116137  002526  002310  1$:     MOVB    PATB(R1),GDATA  ;GET THE PATB DATA BYTE, WE ARE TO USE
                                ;
                                ; DON'T GET CAUGHT BY THE NEXT INSTRUCTION!  'R2'' IS AN OFFSET INTO A
                                ; WORD TABLE WHICH CONTAINS THE ADDRESSES OF THE CSR'S.  THEREFORE, WHEN
                                ; R2 = 0 -- IT POINTS TO BSEL0'S ADDRESS, AND WHEN R2 = 2 -- IT POINTS TO
                                ; BSEL1'S ADDRESS.
                                ;
021464  022702  000002                  CMP     #2,R2           ;IS 'BSEL1'' BEING TESTED?
021470  001003                          BNE     2$              ;IF YES, ALTER PATB DATA SO THAT BIT 7 IS
                                                                ;ALWAYS SET, AND BIT6 IS ALWAYS RESET.
                                                                ;ELSE, USE PATB DATA AS IS.
                                ;
021472  142737  000300  002310          BICB    #RUN!MCLR,GDATA ;FORCE PATTERN TO RESET BITS 7 & 6
                                ;
021500  113772  002310  002352  2$:     MOVB    GDATA,@BSEL0(R2)  ;PUT PATB DATA INTO REGISTER BEING TESTED
```

```
4075  021506  123772  002310  002352          CMPB    GDATA,@BSEL0(R2)  ; COMPARE PATTERN JUST WRITTEN
4076  021514  001414                          BEQ     5$                ;TEST PASSES IF A MATCH. ELSE, DEVICE FATAL ERROR
4077
4078                                          ;--PREPARE FOR THE FAILURE PRINTOUT--
4079
4080  021516  010237  002334                  MOV     R2,REGNUM         ;GET THE REGISTER THAT FAILED
4081  021522  117237  002352  002312          MOVB    @BSEL0(R2),BDATA  ;SCORE THE BAD DATA
4082  021530  004737  004434                  JSR     PC,GETBSR         ;GET THE BSEL REGISTERS FOR DUMPING
4083  021534                                  GEDF    EM7,ERR2          ;REPORT ERROR AND EXIT THE TEST
4084                                          ;       'DEVICE FATAL'' ERROR # 12
4085  021534  104455                                                    TRAP    C$ERDF
4086  021536  000014                                                    .WORD   12
4087  021540  014564                                                    .WORD   EM7
4088  021542  005304                                                    .WORD   ERR2
4089  021544  000406                          BR      24$
4090
4091  021546  005201                  5$:     INC     R1                ;MOVE TABLE POINTER
4092  021550  077336                          SOB     R3,1$             ;DECREMENT NUMBER OF PATTERNS LEFT. IF ZERO,EXIT.
4093                                                                    ;ELSE, CONTINUE TO PATTERN TEST REGISTER
4094  021552  005722                          TST     (R2)+             ;INCREMENT THE REGISTER INDEX BY 2
4095  021554  020227  000040                  CMP     R2,#<CSREGS*2>    ;COMPARE REGISTER INDEX TO NUMBER OF CSR'S
4096  021560  101336                          BHI     1$                ;IF R2 > 17, END THE TEST
4097
4098  021562                          24$:
4099  021562                                  ENDTST
4100  021562                                                    L10030:
4101  021562  104401                                                    TRAP    C$ETST
```

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

                        ;++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                        ;*
                        ;*      TEST 5 -- BASIC MASTER CLEAR
                        ;*
                        ;* PERFORM AN INITIAL MASTER CLEAR.  WRITE 377 INTO BSEL0 AND READ AND CHECK IT.
                        ;* THEN, ISSUE A MASTER CLEAR AND READ AND CHECK BSEL0 FOR 000.
                        ;*
                        ;--**********************************************************************************
                        ;
                        ;       BGNTST
021564                                                                          T5::
                        ; ISSUE A MASTER CLEAR, AND DELAY FOR MICRO-DIAGNOSTICS TO COMPLETE BY CALLING
                        ; SUBROUTINE MASCLR.

021564  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
021570  103002                  BCC     8$              ;IF NO ERROR, PROCEED
021572                          ERROR                   ;ELSE, REPORT IT AND
021572  104460                                                          TRAP    C$ERROR
021574  000441                  BR      24$             ;       EXIT THIS TEST

021576  112777  000377  160546  8$:     MOVB    #377,@BSEL0     ;SET BSEL TO ALL ONES
021604  122777  000377  160540          CMPB    #377,@BSEL0     ;COMPARE
021612  001011                  BNE     2$              ;A MISMATCH INDICATES A DEVICE FATAL ERROR

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

021614  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
021620  103002                  BCC     9$              ;IF NO ERROR, PROCEED
021622                          ERROR                   ;ELSE, REPORT IT AND
021622  104460                                                          TRAP    C$ERROR
021624  000425                  BR      24$             ;       EXIT THIS TEST

021626  122777  000000  160516  9$:     CMPB    #000,@BSEL0     ; THIS REGISTER SHOULD BE ZEROED DURING
                                                        ;INITIALIZATION
021634  001421                  BEQ     24$             ;IF ZERO, *** TEST PASSES ***, ELSE REPORT ERROR
                                ;--PREPARE FOR THE FAILURE PRINTOUT--
021636  112737  000377  002310  2$:     MOVB    #377,GDATA      ;ALL ONES IS EXPECTED DATA
021644  117737  160502  002312          MOVB    @BSEL0,BDATA    ;SOMETHING OTHER THAN ALL ONES WAS FOUND. SCORE IT.
021652  004737  004434          JSR     PC,GETBSR       ;GET THE BSEL REGISTERS FOR DUMPING
021656  105077  160470          CLRB    @BSEL0          ;DISABLE INTERRUPTS AS A PRECAUTIONARY MEASURE
021662  012737  000000  002334  MOV     #0,REGNUM       ;GET THE REGISTER THAT FAILED
021670                          GEDF    EM5,ERR2        ;REPORT DEVICE FATAL ERROR
                                                        ;       'DEVICE FATAL" ERROR # 13
021670  104455                                                          TRAP    C$ERDF
021672  000015                                                          .WORD   13
021674  014515                                                          .WORD   EM5
021676  005304                                                          .WORD   ERR2
021700  105077  160446          24$:    CLRB    @BSEL0          ;DISABLE INTERRUPTS AS A PRECAUTIONARY MEASURE
```

```
                        ENDTST
 4158  021704
 4159  021704
 4160  021704  104401                L10031:  TRAP    C$ETST
```

```
                                .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
021706                                                                  T6::
021706  032737  000001  002350          BIT     #BIT0,PFLAG     ;IF BUS RESETS ARE NOT ALLOWED,
021714  001072                          BNE     24$             ;  BYPASS THIS TEST

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

021716  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
021722  103002                          BCC     8$              ;IF NO ERROR, PROCEED
021724                                  ERROR                   ;ELSE, REPORT IT AND
021724  104460                                                                  TRAP    C$ERROR
021726  000465                          BR      24$             ;       EXIT THIS TEST

021730  112777  000377  160414  8$:     MOVB    #377,@BSEL0     ;SET ALL BITS IN BSEL0
021736  122777  000377  160406          CMPB    #377,@BSEL0     ;COMPARE TO ALL BITS SET
021744  001035                          BNE     1$              ;A MISMATCH IS A DEVICE FATAL ERROR

021746                                  BRESET                  ;FORCE AN EXTERNAL BUS RESET.  THIS SHOULD
021746  104433                                                                  TRAP    C$RESET
                                                                ;CAUSE BSEL0=0 IN ABOUT 100 MICROSECONDS

                                ; DELAY ABOUT 500 MILLISECONDS FOR THE MICRODIAGNOSTIC TO COMPLETE

021750  013701  002316          MOV     DELAY1,R1       ;INITIALIZE COUNTER
021754  105737  002317  2$:     TSTB    DELAY1+1        ;THIS IS A DUMMY INSTRUCTION TO LENGTHEN THE DELAY
021760  005301                  DEC     R1              ;TIME TO GET OUT OF THE DELAY?
021762  001374                  BNE     2$              ;NO,

021764  122777  000000  160360          CMPB    #000,@BSEL0     ;YES, CHECK FOR REGISTER TO BE ZERO
021772  001443                          BEQ     24$             ;A MISMATCH IS A DEVICE FATAL ERROR
                                                                ;ELSE, END TEST.

                                ;--PREPARE FOR THE FAILURE PRINTOUT--

021774  117737  160352  002312          MOVB    @BSEL0,BDATA    ;GET THE ACTUAL DATA
022002  004737  004434                  JSR     PC,GETBSR       ;GET THE BSEL REGISTERS FOR DUMPING
022006  105077  160340                  CLRB    @BSEL0          ;DISABLE INTERRUPTS AS A PRECAUTIONARY MEASURE
022012  012737  000000  002310          MOV     #000,GDATA      ;GET THE EXPECTED DATA
022020  012737  000000  002334          MOV     #0,REGNUM       ;GET THE REGISTER THAT FAILED
022026                                  GEDF    EM9,ERR2        ;EXTERNAL BUS RESET FAILURE
                                                                ;       'DEVICE FATAL'' ERROR # 14
```

```
4217  022026  104455                                                          TRAP    C$ERDF
4218  022030  000016                                                          .WORD   14
4219  022032  014634                                                          .WORD   EM9
4220  022034  005304                                                          .WORD   ERR2
4221  022036  000421                      BR      24$
4222
4223  022040  117737  160306  002312  1$: MOVB    @BSEL0,BDATA    ;GET THE ACTUAL DATA
4224  022046  004737  004434              JSR     PC,GETBSR       ;GET THE BSEL REGISTERS FOR DUMPING
4225  022052  105077  160274              CLRB    @BSEL0          ;DISABLE INTERRUPTS AS A PRECAUTIONARY MEASURE
4226  022056  112737  000377  002310      MOVB    #377,GDATA      ;ALL ONES WAS EXPECTED DATA
4227  022064  012737  000000  002334      MOV     #0,REGNUM       ;GET THE REGISTER THAT FAILED
4228  022072                              GEDF    EM8,ERR2        ;BSEL0 COULD NOT BE SET TO ALL ONES
4229                                                              ;       'DEVICE FATAL'' ERROR # 15
4230  022072  104455                                                          TRAP    C$ERDF
4231  022074  000017                                                          .WORD   15
4232  022076  014611                                                          .WORD   EM8
4233  022100  005304                                                          .WORD   ERR2
4234  022102  105077  160244          24$: CLRB    @BSEL0          ;DISABLE INTERRUPTS AS A PRECAUTIONARY MEASURE
4235  022106                              ENDTST
4236  022106                                                                L10032:
4237  022106  104401                                                          TRAP    C$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
                                                                                T7::
                                BGNSUB
                                                                                T7.1:
                                                                                        TRAP    C$BSUB
022110 104402
022112 004737 003762            JSR     PC,MSTCLR       ;PUT THE MICROPROCESSOR IN THE MAINTENANCE LOOP
022116 103003                   BCC     10$             ;IF NO ERROR, PROCEED
022120                          ERROR                   ;ELSE, REPORT IT AND
                                                                                        TRAP    C$ERROR
022122 000137 022614            JMP     ENDT7           ;       EXIT THIS TEST

022126 012777 000020 160226 10$:MOV     #SLT0,@SEL4     ;PUT ADDRESS OF SELECT REGISTER 0 IN 'ADDRESS' REG
022134 012777 000125 160224     MOV     #125,@SEL6      ;PUT THE DATA TO BE WRITTEN IN 'DATA' REGISTER

022142 027727 160204 000400     CMP     @SEL0,#400      ;ONLY 'MREQ' SHOULD BE SET
022150 001411                   BEQ     1$              ;IF IT IS, PROCEED WITH TESTING
                                                        ;ELSE, SETUP FOR (& REPORT) THE ERROR
022152 017737 160174 002312     MOV     @SEL0,BDATA     ;  BAD DATA
022160 012737 000400 002310     MOV     #400,GDATA      ;  GOOD DATA
022166 005037 002334            CLR     REGNUM          ;  REG. NUMBER
022172 000451                   BR      4$

022174 027727 160156 000200 1$: CMP     @SEL2,#200      ;'MRDY' SET?  (ALSO CHECKED BY 'MSTCLR')
022202 001412                   BEQ     2$              ;YES, PROCEED WITH TESTING
022204 017737 160146 002312     MOV     @SEL2,BDATA     ;  BAD DATA
022212 012737 000200 002310     MOV     #200,GDATA      ;  GOOD DATA
022220 012737 000002 002334     MOV     #2,REGNUM       ;  THE REG. THAT FAILED
022226 000433                   BR      4$              ;EXIT TEST

022230 027727 160126 000020 2$: CMP     @SEL4,#SLT0     ;COMPARE SELECT REGISTER 4 WITH THE ADDRESS SENT
022236 001412                   BEQ     3$              ;A MISMATCH IS A DEVICE FATAL ERROR
```

```
4294  022240  017737  160116  002312          MOV     @SEL4,BDATA     ;GET THE BAD DATA
4295  022246  012737  000020  002310          MOV     #SLT0,GDATA     ;GET THE GOOD DATA
4296  022254  012737  000004  002334          MOV     #4,REGNUM       ;GET THE REGISTER NUMBER WHICH FAILED
4297  022262  000415                          BR      4$
4298
4299  022264  027727  160076  000125  3$:     CMP     @SEL6,#000125   ;COMPARE SELECT REGISTER 6 WITH THE DATA SENT
4300  022272  001415                          BEQ     60$             ;THIS PART OF THE TEST PASSES IF A MATCH IS FOUND
4301  022274  017737  160066  002312          MOV     @SEL6,BDATA     ;GET THE BAD DATA
4302  022302  012737  000125  002310          MOV     #000125,GDATA   ;GET THE GOOD DATA
4303  022310  012737  000006  002334          MOV     #6,REGNUM       ;GET THE REGISTER NUMBER
4304
4305                                          ;--PREPARE FOR THE FAILURE PRINTOUT--
4306
4307
4308  022316                          4$:     GEDF    EM7,ERR5        ;ELSE, AN ERROR HAS BEEN FOUND
4309                                          ;       'DEVICE FATAL'' ERROR # 16
4310  022316  104455                                                  TRAP    C$ERDF
4311  022320  000020                                                  .WORD   16
4312  022322  014564                                                  .WORD   EM7
4313  022324  005552                                                  .WORD   ERR5
4314  022326                          60$:    ENDSUB
4315  022326                                                  L10034:
4316  022326  104403                                                  TRAP    C$ESUB
4317                                  ;#################### > P A R T  2 < ##################################################
4318  022330                                  BGNSUB
4319  022330                                                  T7.2:
4320  022330  104402                                                  TRAP    C$BSUB
4321
4322  022332  112777  000002  160016          MOVB    #WRILOC,@BSEL2  ;SEND THE WRITE LOCATION COMMAND
4323
4324  022340  032777  000200  160010          BIT     #200,@BSEL2     ;WE SHOULD HAVE IMEDIATLY LOST 'MRDY''.
4325  022346  001421                          BEQ     5$              ;GOT WHAT WE EXPECTED,  WAIT FOR READY AGAIN
4326  022350  017737  160002  002312          MOV     @BSEL2,BDATA    ;SOMETHING WRONG,  SETUP FOR AND REPORT ERROR
4327  022356  004737  004434                  JSR     PC,GETBSR       ;GET THE BSEL REGISTERS FOR DUMPING
4328  022362  012737  000002  002310          MOV     #002,GDATA      ;EXPECTED DATA
4329  022370  012737  000002  002334          MOV     #2,REGNUM       ;WE WERE TESTING BSEL2
4330  022376                                  GEDF    EM15,ERR2
4331                                          ;       'DEVICE FATAL'' ERROR # 17
4332  022376  104455                                                  TRAP    C$ERDF
4333  022400  000021                                                  .WORD   17
4334  022402  014733                                                  .WORD   EM15
4335  022404  005304                                                  .WORD   ERR2
4336  022406                                  ESCAPE  TST
4337  022406  104410                                                  TRAP    C$ESCAPE
4338  022410  000206                                                  .WORD   L10033-.
4339
4340  022412  132777  000200  157736  5$:     BITB    #200,@BSEL2     ;WAIT FOR 'MRDY'' TO GO HIGH AGAIN
4341  022420  001774                          BEQ     5$
4342
4343  022422  004737  004576                  JSR     PC,GETWSR       ;WHEN IT DOES, GET CURRENT REGISTER CONTENTS
4344
4345  022426  023727  002246  000525          CMP     WSR0,#000525    ;COMPARE BYTE SELECT REGISTERS 0 AND 1
4346                                          ;REG 0 = 125, REG 1 = 001
4347  022434  001412                          BEQ     6$              ;THIS PART OF THE TEST PASSES IF A MATCH IS FOUND
4348  022436  012737  000525  002310          MOV     #000525,GDATA   ;GET THE GOOD DATA
4349  022444  013737  002246  002312          MOV     WSR0,BDATA      ;GET THE BAD DATA
```

```
4350  022452  012737  000000  002334          MOV     #0,REGNUM       ;GET THE REGISTER NUMBER
4351  022460  000451                          BR      9$              ;EXIT TEST
4352
4353  022462  023727  002250  000200  6$:     CMP     WSR2,#000200    ;COMPARE BYTE SELECT REGISTERS 2 AND 3
4354                                                                    ;REG 2 = 200 -- 'MRDY' IS SET & COMMAND IS CLEARED
4355                                                                    ;REG 3 = 000 SHOULD BE ZEROES.
4356  022470  001412                          BEQ     7$              ;THIS PART OF THE TEST PASSES IF A MATCH IS FOUND
4357  022472  012737  000200  002310          MOV     #000200,GDATA   ;GET THE GOOD DATA
4358  022500  013737  002250  002312          MOV     WSR2,BDATA      ;GET THE BAD DATA
4359  022506  012737  000002  002334          MOV     #2,REGNUM       ;GET THE REGISTER NUMBER
4360  022514  000433                          BR      9$              ;EXIT TEST
4361
4362                                                                    ;SUBROUTINE ATTEMPTED TO ZERO THIS LOCATION.
4363  022516  023727  002252  000020  7$:     CMP     WSR4,#SLTO      ;REG 4 = 020, THE 6502 ADDRESS TO PUT DATA
4364                                                                    ; REG 5 = 000, ZEROED BY MSTCLR
4365  022524  001412                          BEQ     8$              ;THIS PART OF THE TEST PASSES IF A MATCH IS FOUND
4366  022526  012737  000020  002310          MOV     #SLTO,GDATA     ;GET THE GOOD DATA
4367  022534  013737  002252  002312          MOV     WSR4,BDATA      ;GET THE BAD DATA
4368  022542  012737  000004  002334          MOV     #4,REGNUM       ;GET THE REGISTER NUMBER
4369  022550  000415                          BR      9$              ;EXIT TEST
4370
4371  022552  023727  002254  000125  8$:     CMP     WSR6,#000125    ;REG 6 = 125, THE WRITE DATA
4372  022560  001415                          BEQ     ENDT7           ;THIS PART OF THE TEST PASSES IF A MATCH IS FOUND
4373  022562  012737  000125  002310          MOV     #000125,GDATA   ;GET THE GOOD DATA
4374  022570  013737  002254  002312          MOV     WSR6,BDATA      ;GET THE BAD DATA
4375  022576  012737  000006  002334          MOV     #6,REGNUM       ;GET THE REGISTER NUMBER
4376                                                                    ; REG 7 = 000, ZEROED BY MSTCLR.
4377
4378                                          ;--PREPARE FOR THE FAILURE PRINTOUT--
4379
4380  022604                  9$:     GEDF    EM7,ERR5                ;REPORT ERROR.
4381                                                                    ;       'DEVICE FATAL'' ERROR # 18
4382  022604  104455                                                                  TRAP    C$ERDF
4383  022606  000022                                                                  .WORD   18
4384  022610  014564                                                                  .WORD   EM7
4385  022612  005552                                                                  .WORD   ERR5
4386  022614                  ENDT7:  ENDSUB
4387  022614                                                                L10035:
4388  022614  104403                                                                  TRAP    C$ESUB
4389  022616                          ENDTST
4390  022616                                                                L10033:
4391  022616  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                                                          T8::
022620  004737  003762          ;       JSR     PC,MSTCLR       ;CALL SUBROUTINE TO INITIALIZE THE CSR'S AND
                                ;                               ;PUT THE 6502 INTO THE MAINTENANCE LOOP
022624  103003                  ;       BCC     2$              ;IF NO ERROR, PROCEED
022626                          ;       ERROR                   ;ELSE, REPORT IT AND
022626  104460                  ;                                                       TRAP    C$ERROR
022630  000137  023164          ;       JMP     24$             ;       EXIT THIS TEST

                                ; DO NORMAL WRITE INTO LOCATION USED BY BSEL0

022634  004537  004322  2$:     JSR     R5,WRITEI       ;WRITE INTO BSEL0 THROUGH THE BACK DOOR!
022640  000020                  SLTO                    ;  ADDRESS OF BSEL0 WITHIN RAM
022642  000125          10$:    125                     ;  TEST DATA
022644  103002                  BCC     5$              ;IF AN ERROR OCCURED,
022646                          ERROR                   ;REPORT IT &
022646  104460                                                          TRAP    C$ERROR
022650  000545                  BR      24$             ;  EXIT
022652  123777  022642  157472  5$:     CMPB    10$,@BSEL0      ;DID THE DATA GO INTO BSEL0?
022660  001416                  BEQ     11$             ;YES, NOW TRY IT WITH THE 'RUN' BIT OFF
022662  017737  157464  002312          MOV     @SEL0,BDATA     ;NO,  SETUP & PRINT ERROR MESSAGE
022670  013737  022642  002310          MOV     10$,GDATA
022676  005037  002334                  CLR     REGNUM          ;WE'RE SINGLING OUT SEL0 FOR THE MESSAGE
022702                          ;       GEDF    EM16,ERR5
                                ;               'DEVICE FATAL'' ERROR # 19
022702  104455                                                          TRAP    C$ERDF
022704  000023                                                          .WORD   19
022706  015013                                                          .WORD   EM16
022710  005552                                                          .WORD   ERR5
022712                          ESCAPE  TST             ;IF THIS WRITE DIDN'T WORK, THERE IS NO SENSE
022712  104410                                                          TRAP    C$ESCAPE
022714  000250                                                          .WORD   L10036-.
                                ;IN TRYING IT WITH 'RUN' OFF!

022716  105077  157430  11$:     CLRB    @BSEL0          ;CLEAR BSEL0 AGAIN
                                ;REG'S ARE ALREADY SETUP FROM PREVIOUS WRITE
022722  142777  000200  157424          BICB    #RUN,@BSEL1     ;TURN OFF THE RUN BIT -- & HOPEFULLY THE 6502 ALSO
022730  112777  000002  157420          MOVB    #WRILOC,@BSEL2  ;TELL MLOOP TO WRITE AGAIN
```

```
4448
4449                                    ;AT THIS POINT, THE DMV-11 SHOULD BE QUIESCENT.  IT SHOULDN'T EVEN KNOW THAT
4450                                    ;WE HAVE CLEARED 'MRDY'.  THEREFOR, THERE SHOULD BE NO CHANGE IN ANY OF THE
4451                                    ;REGISTERS FOR AS LONG AS WE CARE TO WAIT AND WATCH.  THE ONLY CHANGE THAT WE
4452                                    ;COULD POSSIBLY SEE WOULD BE 'MRDY' BEING SET AGAIN AND/OR BSEL0 GETTING
4453                                    ;LOADED WITH THE TEST DATA -- WHICH IS WHAT THE REQUESTED COMMAND SHOULD
4454                                    ;ACCOMPLISH WHEN THE FUNCTION IS ALLOWED TO RUN AGAIN.
4455
4456  022736  013701  002320                      MOV     DELAY2,R1       ;SETUP AND WAIT FOR A WHILE.
4457  022742  132777  000200  157406  12$:        BITB    #MRDY,@BSEL2    ;WHILE WE'RE WAITING, WE MAY AS WELL CHECK 'MRDY'
4458  022750  001042                              BNE     14$             ;IF IT GETS SET, WE HAVE AN ERROR BECAUSE
4459                                                                      ;NOTHING WAS SUPPOSED TO HAPPEN WITHIN
4460                                                                      ;THE 6502 MICRO-PROCESSOR
4461  022752  105777  157374                      TSTB    @BSEL0          ;WHILE WE'RE AT IT, WE MAY AS WELL LOOK AT
4462  022756  001063                              BNE     15$             ;BSEL0.  THAT ALSO ISN'T SUPPOSED TO CHANGE.
4463  022760  077110                              SOB     R1,12$          ;DECREMENT AND CHECK COUNTER -- LOOP TILL DONE
4464
4465                                    ;IF EVERYTHING GOES OK, WE SHOULD FALL OUT OF THE LOOP TO HERE.  OTHERWISE,
4466                                    ;'MRDY' OR BSEL0 COULD CHANGE SENDING US TO '14$' OR '15$' RESPECTIVELY TO
4467                                    ;PRINT AN APPROPRIATE (WE HOPE) ERROR MESSAGE.
4468
4469                                    ;IF WE DO GET TO HERE, WE CAN NOW SET 'RUN' AND THE MLOOP SHOULD PERFORM THE
4470                                    ;REQUESTED FUNCTION.
4471
4472  022762  152777  000200  157364              BISB    #RUN,@BSEL1     ;SET 'RUN' AND ALLOW THE 6502 TO RUN AGAIN
4473
4474                                    ;NOW ALL WE HAVE TO DO IS WAIT AGAIN AS BEFORE.  EXCEPT THAT THIS TIME 'MRDY'
4475                                    ;OR BSEL0 GETTING SET IS THE VALID CONDITION -- NOT THE ERROR.  FAILURE TO
4476                                    ;PERFORM IS NOW THE ERROR WE'RE LOOKING FOR.
4477
4478  022770  013701  002320                      MOV     DELAY2,R1       ;SETUP AND WAIT FOR A WHILE.
4479  022774  132777  000200  157354  13$:        BITB    #MRDY,@SEL2     ;WHILE WE'RE WAITING, 'MRDY' SHOULD GO NON-ZERO
4480  023002  001070                              BNE     24$             ;IF IT GETS SET, WE CAN ASSUME THAT SOMETHING
4481                                                                      ;COMPLETED.  AT LEASE WE WERE ABLE TO GET THE
4482                                                                      ;6502 MICRO-PROCESSOR RUNNING AGAIN
4483  023004  077105                              SOB     R1,13$          ;DECREMENT AND CHECK COUNTER -- LOOP TILL DONE
4484
4485                                    ;IF WE GET HERE, WE WEREN'T ABLE TO RESTORE THE 6502 TO A RUNNING STATE!
4486
4487  023006  117737  157344  002312              MOVB    @SEL2,BDATA     ;SETUP FOR THE ERROR MESSAGE -- GET BAD DATA
4488  023014  004737  004434                      JSR     PC,GETBSR       ;GET THE BSEL REGISTERS FOR DUMPING
4489  023020  113737  002312  002310              MOVB    BDATA,GDATA     ;PICK THE REGISTER'S DATA.  THE ONLY DIFFERANCE
4490  023026  152737  000200  002310              BISB    #MRDY,GDATA     ;BETWEEN GOOD & BAD IS THE 'MRDY' BIT
4491  023034  012737  000002  002334              MOV     #2,REGNUM       ;INDICATE THAT WE'RE LOOKING AT BSEL2
4492  023042                                      GEDF    EM17,ERR2       ;NOW REPORT THE ERROR
4493                                                                      ;       'DEVICE FATAL' ERROR # 20
4494  023042  104455                                                                      TRAP    C$ERDF
4495  023044  000024                                                                       WORD    20
4496  023046  015110                                                                      .WORD   EM17
4497  023050  005304                                                                      .WORD   ERR2
4498  023052                                      ESCAPE  TST             ;EXIT TEST (OR LOOP, MAYBE?)
4499  023052  104410                                                                      TRAP    C$ESCAPE
4500  023054  000110                                                                      .WORD   L10036-.
4501
4502                                    ;IF WE GET HERE, BSEL2 CHANGED WHEN THE 6502 WASN'T SUPPOSED TO BE RUNNING!
4503
```

```
4504  023056  117737  157274  002312  14$:    MOVB    @BSEL2,BDATA    ;GET THE UNEXPECTEDLY ALTERED CONTENTS OF BSEL2
4505  023064  004737  004434                  JSR     PC,GETBSR       ;GET THE BSEL REGISTERS FOR DUMPING
4506  023070  113737  002312  002310          MOVB    BDATA,GDATA     ;PICK THE REGISTER'S DATA.  THE ONLY DIFFERANCE
4507  023076  142737  000200  002310          BICB    #MRDY,GDATA     ;BETWEEN GOOD & BAD IS THE 'MRDY' BIT
4508  023104  012737  000002  002334          MOV     #2,REGNUM       ;INDICATE THAT WE'RE LOOKING AT BSEL2
4509  023112                                  GEDF    EM17A,ERR2      ;NOW REPORT THE ERROR
4510                                                                  ;       'DEVICE FATAL'' ERROR # 21
4511  023112  104455                                                          TRAP    C$ERDF
4512  023114  000025                                                          .WORD   21
4513  023116  015170                                                          .WORD   EM17A
4514  023120  005304                                                          .WORD   ERR2
4515  023122                                  ESCAPE  TST             ;EXIT TEST (OR LOOP, MAYBE?)
4516  023122  104410                                                          TRAP    C$ESCAPE
4517  023124  000040                                                          .WORD   L10036-.
4518
4519                                  ;IF WE GET HERE, BSEL0 CHANGED WHEN THE 6502 WASN'T SUPPOSED TO BE RUNNING!
4520
4521  023126  117737  157220  002312  15$:    MOVB    @BSEL0,BDATA    ;GET THE UNEXPECTEDLY ALTERED CONTENTS OF BSEL0
4522  023134  004737  004434                  JSR     PC,GETBSR       ;GET THE BSEL REGISTERS FOR DUMPING
4523  023140  105037  002310                  CLRB    GDATA           ;IT WAS SUPPOSED TO STAY AT ZERO
4524  023144  105037  002334                  CLRB    REGNUM          ;INDICATE THAT WE'RE LOOKING AT BSEL0
4525  023150                                  GEDF    EM17A,ERR2      ;NOW REPORT THE ERROR
4526                                                                  ;       'DEVICE FATAL'' ERROR # 22
4527  023150  104455                                                          TRAP    C$ERDF
4528  023152  000026                                                          .WORD   22
4529  023154  015170                                                          .WORD   EM17A
4530  023156  005304                                                          .WORD   ERR2
4531  023160                                  ESCAPE  TST             ;EXIT TEST (OR LOOP, MAYBE?)
4532  023160  104410                                                          TRAP    C$ESCAPE
4533  023162  000002                                                          .WORD   L10036-.
4534
4535                                  ;IF WE GET HERE, THE TEST APPEARS TO HAVE PASSED WITH FLYING COLOURS
4536
4537  023164                          24$:    ENDTST
4538  023164                                                          L10036:
4539  023164  104401                                                          TRAP    C$ETST
```

```
4540                                    .SBTTL TEST 9 -- LOW RAM (00-0F) SCRATCHPAD
4541
4542                                    ;+*****************************************************************************
4543                                    ;*
4544                                    ;*      TEST 9 -- LOW RAM (00-0F) SCRATCHPAD
4545                                    ;*
4546                                    ;* THIS TEST FIRST PERFORMS AN ADDRESSING TEST OF RAM LOCATIONS (00-0F), BY
4547                                    ;* WRITING THE ADRS INTO EACH LOCATION AND AFTER EACH WRITE, ALL THE LOCATIONS
4548                                    ;* ARE READ AND CHECKED FOR EXPECTED CONTENTS.
4549                                    ;*
4550                                    ;* THEN, THE TEST PERFORMS READ/WRITE DATA TESTING OF RAM LOCATIONS 00-0F,
4551                                    ;* BY WRITING, READING, AND COMPARING ALL BYTES OF DATA PATTERN B IN EACH
4552                                    ;* LOCATION.
4553                                    ;*   DATA PATTERN B = 125, 252, 000, 377, 001, 002, 004, 010, 020, 040, 100,
4554                                    ;*                    200, 376, 375, 373, 367, 357, 337, 277, 177, 000
4555                                    ;*
4556                                    ;-*****************************************************************************
4557                                    ;
4558                                    ;       BGNTST
4559  023166                                                                                T9::
4560  023166  004737  003762                   JSR     PC,MSTCLR       ;INIT DMV & ENTER M-LOOP
4561  023172  103003                           BCC     1$              ;IF NO ERROR, PROCEED WITH TESTING
4562  023174                                   ERROR                   ;ELSE, REPORT ERROR
4563  023174  104460                                                                   TRAP    C$ERROR
4564  023176                                   ESCAPE  TST             ;   & EXIT TEST
4565  023176  104410                                                                   TRAP    C$ESCAPE
4566  023200  000152                                                                   .WORD   L10037-.
4567  023202  012737  000001  002444  1$:      MOV     #1,TMP2         ;DATA GENERATION ALGORITHM CODE
4568  023210  012737  003777  002474          MOV     #2047.,TMPE     ;LAST VALID ADDRESS
4569  023216  004737  023354          2$:     JSR     PC,T9.RST       ;RESET TMP3, TMPA, & TMPF
4570  023222  005037  002450                  CLR     TMP4            ;TEST DATA
4571  023226  005037  002452                  CLR     TMP5            ;ACTUAL DATA
4572
4573                                    ; IN THIS PHASE OF TESTING WE WRITE, READ & CHECK EACH LOCATION INDIVIDUALLY.
4574
4575  023232  004737  023372          4$:     JSR     PC,WRCRAM       ;WRITE, READ, & CHECK 1 BYTE OF RAM
4576  023236  103003                          BCC     5$              ;IF NO ERROR, PROCEED
4577  023240                                  ERROR                   ;ELSE, REPORT IT
4578  023240  104460                                                                   TRAP    C$ERROR
4579  023242                                  ESCAPE  TST             ;   & LOOP IF ERROR
4580  023242  104410                                                                   TRAP    C$ESCAPE
4581  023244  000106                                                                   .WORD   L10037-.
4582  023246  005237  002464          5$:     INC     TMPA            ;POINT TO NEXT LOCATION
4583  023252  023737  002464  002474          CMP     TMPA,TMPC       ;HAVE WE TESTED ALL OF RAM?
4584  023260  101764                          BLOS    4$              ;NO, TEST ANOTHER BYTE
4585  023262                                  BREAK                   ;ELSE, SEE IF A 'C HAS BEEN STRUCK
4586  023262  104422                                                                   TRAP    C$BRK
4587                                                                  ;THEN PROCEED TO THE NEXT PHASE OF TESTING
4588
4589                                    ; IN THIS PHASE OF TESTING WE READ & CHECK DATA WHICH SHOULD ALREADY BE IN
4590                                    ; EACH LOCATION OF RAM BEING CHECKED.
4591
4592  023264  004737  023354                  JSR     PC,T9.RST       ;RESET TMP3, TMPA, & TMPF
4593  023270  004737  023570          8$:     JSR     PC,RCRAM        ;READ & CHECK 1 BYTE OF RAM
4594  023274  103001                          BCC     9$              ;IF NO ERROR, PROCEED
4595  023276                                  ERROR                   ;ELSE, REPORT IT
```

```
4596  023276  104460                                                          TRAP    C$ERROR
4597  023300  005237  002464          9$:     INC     TMPA            ;POINT TO NEXT LOCATION
4598  023304  023737  002464  002474         CMP     TMPA,TMPE       ;HAVE WE TESTED ALL OF RAM?
4599  023312  101766                         BLOS    8$              ;NO, TEST ANOTHER BYTE
4600  023314                                 BREAK                   ;ELSE, SEE IF A ^C HAS BEEN STRUCK
4601  023314  104422                                                          TRAP    C$BRK
4602                                                                 ;THEN PROCEED TO THE NEXT PHASE OF TESTING
4603
4604  023316  005037  007104                 CLR     ER47CT          ;RESET ERROR PRINT COUNT
4605  023322  005237  002444                 INC     TMP2            ;  ADVANCE TC NEXT DATA GEN. ALGORITHM CODE
4606  023326  023727  002444  000007         CMP     TMP2,#7         ;HAVE WE DONE ALL THE CODES WE'RE GOING TO DO?
4607  023334  002730                         BLT     2$              ;NO, THEN GO DO THIS PATTERN IN RAM
4608  023336  004537  004322                 JSR     R5.WRITEI       ;ELSE, CLEAR RAM LOCATION 0083 (HEX) & EXIT
4609  023342  000173                         173                     ;       (THIS CONVERTS TO 0083 HEX.)
4610  023344  000000                         0                       ;       (THIS WE HOPE, WILL CLEAR IT)
4611  023346  103001                         BCC     .+4             ;IF NO ERROR, PROCEED
4612  023350                                 ERROR                   ;ELSE, REPORT IT
4613  023350  104460                                                          TRAP    C$ERROR
4614  023352                                 ENDTST
4615  023352                                                                  L10037:
461'  023352  104401                                                          TRAP    C$ETST
4617
4618                          ; RESET THE FOLLOWING THREE REGISTERS
4619
4620  023354  005037  002446  TS.RST: CLR     TMP3            ;TEST DATA PATTERN INDEX
4621  023360  005037  002464          CLR     TMPA            ;RAM LOCATION ADDRESS
4622  023364  005037  002476          CLR     TMPF            ;RESET ALL ERROR FLAGS
4623  023370  000207                 RTS     PC
4624
4625                          ; WRITE, READ, & CHECK ONE LOCATION
4626
4627  023372  010046          WRCRAM: MOV     R0,-(SP)        ;SAVE WORKING REGISTERS
4628
4629  023374  004737  023750          JSR     PC,PATGEN       ;GENERATE ONE DATA PATTERN BYTE
4630
4631  023400  013700  002464          MOV     TMPA,R0         ;GET ADDRESS WHERE WE CAN CHECK IT MORE EASILY
4632  023404  020027  000020          CMP     R0,#SLT0        ;IS ADDRESS BELOW THE SELECT REGESTER AREA?
4633  023410  103412                  BLO     2$              ;YES, GOOD.  IT CAN BE TESTED.
4634  023412  020027  000030          CMP     R0,#SLT0+8.     ;IS IT ABOVE THE SELECT REGISTER AREA?
4635  023416  103007                  BHIS    2$              ;YES, GOOD.  IT CAN BE TESTED.
4636  023420  023727  002444  000006  CMP     TMP2,#6         ;NO, IF "INCREMENTAL", BACK UP INDEX
4637  023426  001055                  BNE     12$             ;ELSE JUST BYPASS TEST
4638  023430  005337  002446          DEC     TMP3            ;DECREMENT INDEX TO WHAT IT WAS BEFORE 'PATGEN'
4639  023434  000452                  BR      12$             ;  AND THEN BYPASS THE TESTING
4640
4641  023436  010037  023452  2$:     MOV     R0,4$           ;SETUP ALL POINTERS FOR THE CURRENT RAM LOCATION
4642  023442  010037  023464          MOV     R0,8$
4643
4644  023446  004537  004310          JSR     R5,WRITE        ;WRITE ONE BYTE OF THE TEST DATA
4645  023452  000000          4$:     .WORD   0               ;**** MODIFIED FROM ABOVE ****
4646  023454  002450                  TMP4                    ;TEST DATA IS IN TMP4
4647  023456  103442                  BCS     14$             ;IF ERROR WRITING, FORGET THE REST
4648
4649  023460  004537  004064          JSR     R5,READ         ;READ THAT BYTE BACK AGAIN
4650  023464  000000          8$:     .WORD   0               ;**** MODIFIED FROM ABOVE ****
4651  023466  002452                  TMP5
```

```
4652  023470  103435                    BCS     14$             ;IF ERROR READING, FORGET THE REST
4653
4654  023472  123737  002450  002452    CMPB    TMP4,TMP5       ;DID WE READ WHAT WE WROTE?
4655  023500  001430                    BEQ     12$             ;YES, EXIT
4656  023502  132737  000002  002476    BITB    #BIT1,TMPF      ;NO, HAVE WE ALREADY DONE THIS ERROR'S HEADER?
4657  023510  001020                    BNE     9$              ;YES, ONLY REPORT DATA
4658  023512  112737  000002  002476    MOVB    #BIT1,TMPF      ;ELSE, CALL MONITOR & PRINT HEADING
4659  023520                            GTDF    EM47A,ERR47     ;QUEUE UP THE ERROR MESSAGE
4660                                                            ;       QUEUE 'DEVICE FATAL'' ERROR # 23
4661  023520  012737  000001  002236                                                    MOV     #T.EDF,ERRTYP
4662  023526  012737  000027  002240                                                    MOV     #23,ERRNBR
4663  023534  012737  015675  002242                                                    MOV     #EM47A,ERRMSG
4664  023542  012737  006724  002244                                                    MOV     #ERR47,ERRBLK
4665  023550  000402                    BR      10$
4666
4667  023552  004737  007110        9$: JSR     PC,ERR47.       ;JUST PRINT DATA
4668  023556  000261                10$: SEC                    ;       & SET THE ERROR FLAG
4669  023560  000401                    BR      14$             ;       & GO DIRECTLY TO THE EXIT 'RTS''
4670
4671  023562  000241                12$: CLC                    ;NORMAL EXIT - MAKE SURE THE ERROR FLAG IS CLEAR
4672  023564  012600                14$: MOV     (SP)+,R0       ;RESTORE WORK REGISTERS
4673  023566  000207                    RTS     PC
4674
4675  023570  010046                RCRAM: MOV   R0,-(SP)        ;SAVE WORKING REGISTERS
4676
4677  023572  004737  023750            JSR     PC,PATGEN       ;GENERATE ONE DATA PATTERN BYTE
4678
4679  023576  013700  002464            MOV     TMPA,R0         ;GET ADDRESS WHERE WE CAN CHECK IT MORE EASILY
4680  023602  020027  000020            CMP     R0,#SLT0        ;IS ADDRESS BELOW THE SELECT REGESTER AREA?
4681  023606  103412                    BLO     2$              ;YES, GOOD.  IT CAN BE TESTED.
4682  023610  020027  000030            CMP     R0,#SLT0+8.     ;IS IT ABOVE THE SELECT REGISTER AREA?
4683  023614  103007                    BHIS    2$              ;YES, GOOD.  IT CAN BE TESTED.
4684  023616  023727  002444  000006    CMP     TMP2,#6         ;NO, IF ''INCREMENTAL'', BACK UP INDEX
4685  023624  001046                    BNE     12$             ;ELSE JUST BYPASS TEST
4686  023626  005337  002446            DEC     TMP3            ;DECREMENT INDEX TO WHAT IT WAS BEFORE 'PATGEN'
4687  023632  000443                    BR      12$             ;  AND THEN BYPASS THE TESTING
4688
4689  023634  010037  023644        2$: MOV     R0,8$           ;SETUP POINTER FOR THE CURRENT RAM LOCATION
4690
4691  023640  004537  004064            JSR     R5,READ         ;READ THAT BYTE BACK AGAIN
4692  023644  000000                8$: .WORD   0               ;**** MODIFIED FROM ABOVE ****
4693  023646  002452                    TMP5
4694  023650  103435                    BCS     14$             ;IF ERROR READING, FORGET THE REST
4695
4696  023652  123737  002450  002452    CMPB    TMP4,TMP5       ;WAS THIS LOC. STILL OK?
4697  023660  001430                    BEQ     12$             ;YES, EXIT
4698  023662  132737  000004  002476    BITB    #BIT2,TMPF      ;NO, HAVE WE ALREADY DONE THIS ERROR'S HEADER?
4699  023670  001020                    BNE     9$              ;YES, ONLY REPORT DATA
4700  023672  112737  000004  002476    MOVB    #BIT2,TMPF      ;ELSE, CALL MONITOR & PRINT HEADING
4701  023700                            GTDF    EM47B,ERR47     ;QUEUE UP THE ERROR MESSAGE
4702                                                            ;       QUEUE 'DEVICE FATAL'' ERROR # 24
4703  023700  012737  000001  002236                                                    MOV     #T.EDF,ERRTYP
4704  023706  012737  000030  002240                                                    MOV     #24,ERRNBR
4705  023714  012737  015735  002242                                                    MOV     #EM47B,ERRMSG
4706  023722  012737  006724  002244                                                    MOV     #ERR47,ERRBLK
4707  023730  000402                    BR      10$
```

```
4708
4709  023732  004737  007110          9$:     JSR     PC,ERR47.       ;JUST PRINT DATA
4710  023736  000261                  10$:    SEC                     ;       & SET THE ERROR FLAG
4711  023740  000401                          BR      14$             ;       & GO DIRECTLY TO THE EXIT 'RTS'
4712
4713  023742  000241                  12$:    CLC                     ;NORMAL EXIT - MAKE SURE THE ERROR FLAG IS CLEAR
4714  023744  012600                  14$:    MOV     (SP)+,R0        ;RESTORE WORK REGISTERS
4715  023746  000207                          RTS     PC
4716
4717                                  ;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
4718                                  ; PATGEN -- SUBROUTINE TO GENERATE A TEST DATA BYTE FOR A SPECIFIC ELEMENT
4719                                  ;
4720                                  ;       CALLING SEQUENCE:
4721                                  ;
4722                                  ;       <SET TEST PATTERN CODE # IN 'TMP2'>
4723                                  ;       <SET TEST PATTERN INDEX IN 'TMP3'>
4724                                  ;       JSR     PC,PATGEN
4725                                  ;       <NEXT SEQUENCIAL INSTRUCTION>
4726                                  ;
4727                                  ;  TEST PATTERN CODES:
4728                                  ;
4729                                  ;       1 -- ALL ONES
4730                                  ;       2 -- ALL ZEROES
4731                                  ;       3 -- 1 BIT ALTERNATING
4732                                  ;       4 -- 2 BITS ALTERNATING
4733                                  ;       5 -- ADDRESS IN ADDRESS
4734                                  ;       6 -- INCREMENTAL  (INDEX IN ADDRESS)
4735                                  ;
4736                                  ;  THE TEST PATTERN INDEX INDICATES HOW FAR INTO THE TEST PATTERN STRING OF
4737                                  ;  BYTES WE ARE.  I.E. IT SPECIFIES THE NUMBER OF THE BYTE OF THE WHOLE STRING
4738                                  ;  OF BYTES COMPOSING THE COMPLETE TEST PATTERN.
4739                                  ;
4740                                  ;--++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
4741
4742
4743  023750                          PATGEN:
4744  023750  023727  002444  000002          CMP     TMP2,#2         ;DECODE THE TEST PATTERN IDENTIFIER
4745  023756  002414                          BLT     1$              ;0, 1, OR NEGITIVE WILL GIVE ''ALL ONES''
4746  023760  001417                          BEQ     2$              ;2 = 'ALL ZEROES''
4747  023762  023727  002444  000004          CMP     TMP2,#4
4748  023770  002416                          BLT     3$              ;3 = '1 BIT ALTERNATING''
4749  023772  001431                          BEQ     4$              ;4 = '2 BIT ALTERNATING PATTERN''
4750  023774  023727  002446  000006          CMP     TMP3,#6
4751  024002  002441                          BLT     5$              ;5 = ''ADDRESS IN ADDRESS''
4752  024004  001444                          BEQ     6$              ;6 = ''INCREMENTAL''  (INDEX IN ADDRESS)
4753  024006  000404                          BR      2$              ;UNDEFINED = ''ALL ZEROES''
4754
4755  024010  112737  000377  002450  1$:     MOVB    #377,TMP4       ;''ALL ONES'' DATA PATTERN
4756  024016  000443                          BR      60$
4757
4758  024020  105037  002450          2$:     CLRB    TMP4            ;''ALL ZEROES'' DATA PATTERN
4759  024024  000440                          BR      60$
4760
4761  024026  132737  000001  002446  3$:     BITB    #1,TMP3         ;'1 BIT ALTERNATING'' PATTERN
4762  024034  001404                          BEQ     20$             ;IF EVEN, USE '252''
4763  024036  112737  000125  002450          MOVB    #125,TMP4       ;IF ODD, USE '125''
```

```
4764  024044  000430                        BR      60$             ; PATTERN:  10101010
4765  024046  112737  000252  002450  20$:  MOVB    #252,TMP4
4766  024054  000424                        BR      60$             ; PATTERN:  01010101
4767
4768  024056  132737  000001  002446  4$:   BITB    #1,TMP3         ;''2 BIT ALTERNATING'' PATTERN
4769  024064  001404                        BEQ     22$             ;IF EVEN, USE ''214''
4770  024066  112737  000063  002450        MOVB    #063,TMP4       ;IF ODD, USE ''063''
4771  024074  000414                        BR      60$             ; PATTERN:  11001100
4772  024076  112737  000214  002450  22$:  MOVB    #214,TMP4
4773  024104  000410                        BR      60$             ; PATTERN:  00110011
4774
4775  024106  113737  002464  002450  5$:   MOVB    TMPA,TMP4       ;''ADDRESS IN ADDRESS''
4776  024114  000404                        BR      60$
4777
4778  024116  113737  002446  002450  6$:   MOVB    TMP3,TMP4       ;''INCREMENTAL''  (INDEX IN ADDRESS)
4779  024124  000400                        BR      60$
4780
4781  024126  005237  002446          60$:  INC     TMP3            ;INCREMENT PATTERN INDEX FOR NEXT CALL
4782  024132  000207                  62$:  RTS     PC
4783
4784
```

```
                        .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 '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.
                        ;*
                        ;*      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.
                        ;*
```

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

                                ;*      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
                                                                                        T10::
4861  024134
4862  024134  004737  003762           JSR     PC,MSTCLR       ;INIT DMV & ENTER M-LOOP
4863  024140  103003                   BCC     1$              ;IF NO ERROR, PROCEED WITH TESTING
4864  024142                           ERROR                   ;ELSE, REPORT ERROR
4865  024142  104460                                                           TRAP    C$ERROR
4866  024144                           ESCAPE  TST             ;   & EXIT TEST
4867  024144  104410                                                           TRAP    C$ESCAPE
4868  024146  000744                                                           .WORD   L10040-.
4869  024150                         1$:
                                ;========== ACTUAL MOVING INVERSIONS ALGORITHM ==============================
4870
4871
                                ;---------  INITIALIZE OUTER LOOP  ------------------------------------------
4872
4873
4874  024150  012737  000030  002440         MOV     #24.,TMP0       ;INIT. POINTER TO 1'ST RAM LOC. AFTER SEL REG'S
4875  024156  012737  003777  002474         MOV     #2047.,TMPE     ;IDENTIFY LAST ADDRESS TO BE TESTED
4876  024164  005037  002462                 CLR     TMP9
4877  024170  005037  002476                 CLR     TMPF            ;ERROR FLAG -- INDICATE NO ERRORS YET
4878  024174  012737  177777  002470         MOV     #-1,TMPC        ;DATA = 1'S FIRST
4879
                                ;---------  INITIALIZE THE AREA BEING TESTED BY CLEARING IT TO ZEROES  --------
4880
4881
                                ;   ZERO OUT LOCATIONS 0 THROUGH 10 (HEX) -- THOSE BELOW THE SELECT REGISTERS
4882
4883
4884  024202  005037  024216           CLR     3$              ;INITIALIZE ADDRESS
4885  024206  012703  000020           MOV     #SLT0,R3        ;RAM ADDRESS OF BSEL0 WILL DO AS BYTE COUNT
4886
4887  024212  004537  004322         2$:       JSR     R5,WRITEI       ;ZERO OUT LOC'S 0 --> 10 (HEX)
4888  024216  000000                 3$:       .WORD   0               ;  ADDRESS
4889  024220  000000                           0                       ;  DATA
4890  024222  103003                           BCC     .+10            ;IF NO ERROR, PROCEED
4891  024224                                   ERROR                   ;ELSE, REPORT IT
4892  024224  104460                                                                   TRAP    C$ERROR
4893  024226                                   ESCAPE  TST             ;       AND EXIT THIS TEST
4894  024226  104410                                                                   TRAP    C$ESCAPE
4895  024230  000662                                                                   .WORD   L10040-.
4896  024232  005237  024216           INC     3$              ;POINT TO NEXT LOCATION
```

```
4897  024236  077313                          SOB     R3,2$           ;IF MORE TO BE DONE, DO IT
4898
4899                                  ;   ZERO OUT THE REST OF RAM -- ALL LOC'S ABOVE THE SELECT REGISTERS
4900
4901  024240  013737  002440  024264          MOV     TMP0,6$         ;FIRST LOCATION OF TEST AREA (18 HEX)
4902  024246  013703  002474                  MOV     TMPE,R3         ;START WITH 'LAST ADDR. TO BE TESTED'' AND CALC.
4903  024252  163703  002440                  SUB     TMP0,R3         ;THE # OF LOCATIONS TO BE TESTED (800-18 (HEX))
4904  024256  005203                          INC     R3              ; (THIS MAKES SURE WE GET EVERY SINGLE BYTE)
4905
4906  024260  004537  004322          4$:     JSR     R5,WRITEI       ;ZERO OUT THE ALL OF THE TEST AREA
4907  024264  000000          6$:     .WORD   0
4908  024266  000000                  0
4909  024270  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
4910  024272                          ERROR                   ;ELSE, REPORT IT
4911  024272  104460                                                          TRAP    C$ERROR
4912  024274                          ESCAPE  TST             ;       AND EXIT THIS TEST
4913  024274  104410                                                          TRAP    C$ESCAPE
4914  024276  000614                                                          .WORD   L10040-.
4915  024300  005237  024264                  INC     6$              ;POINT TO NEXT LOCATION
4916  024304  077313                          SOB     R3,4$           ;IF MORE TO BE DONE, DO IT
4917  024306  105037  002450                  CLRB    TMP4            ;THIS IS WHAT WE JUST SET ALL RAM LOCATIONS TO
4918
4919                                  ;---------  BEGINNING OF OUTER LOOP  ----------------------------------------
4920
4921  024312  005037  002472          8$:     CLR     TMPD            ;'SET FWD SEQUENCE''  (DIRECTION FLAG)
4922  024316  005037  002466                  CLR     TMPB            ;'SET BIT POSITION = 0''  (BIT POINTER)
4923                                                                  ;'SET ADDRESS = 0''  BUT OUR MEMORY STARTS a
4924                                                                  ;    18 HEX.  SO:
4925  024322  005037  002464                  CLR     TMPA            ;       INITIALIZE ADDRESS POINTER
4926  024326  112737  000001  002451          MOVB    #BIT0,TMP4+1    ;INITIALIZE CURRENT & NEXT DATA BYTES
4927
4928                                  ;---------  'READ CURRENT ADDRESS''  ----------------------------------------
4929
4930  024334  000240          10$:    NOP
4931  024336  000240                  NOP
4932  024340                          BREAK                   ;FIRST SEE IF A ^C HAS BEEN STRUCK BY OPERATOR
4933  024340  104422                                                          TRAP    C$BRK
4934  024342  013737  002464  024354          MOV     TMPA,40$        ;NO,  PUT ADDRESS INTO READ CALL
4935  024350  004537  004064                  JSR     R5,READ         ;GO READ ONE LOCATION
4936  024354  000000          40$:    0               ;**** MODIFIED ABOVE **** (ADDRESS)
4937  024356  002452                  TMP5            ;ADDRESS OF DATA READ
4938  024360  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
4939  024362                          ERROR                   ;ELSE, REPORT IT
4940  024362  104460                                                          TRAP    C$ERROR
4941  024364                          ESCAPE  TST             ;       AND EXIT THIS TEST
4942  024364  104410                                                          TRAP    C$ESCAPE
4943  024366  000524                                                          .WORD   L10040-.
4944
4945                                  ;---------  CHECK DATA (FIRST TIME)  ----------------------------------------
4946
4947  024370  000240                  NOP
4948  024372  000240                  NOP
4949  024374  123737  002452  002450          CMPB    TMP5,TMP4       ;CHECK AGAINST EXPECTED DATA
4950  024402  001421                  BEQ     12$             ;IF OK, PROCEED
4951  024404  032737  000006  002476          BIT     #BIT1+BIT2,TMPF ;NO,  HAS AN ERROR ALREADY BEEN REPORTED?
4952  024412  001010                  BNE     42$             ;YES, JUST PRINT DATA IF WANTED
```

```
4953  024414  012737  000002  002476          MOV     #BIT1,TMPF      ;NO,  SET FLAG FOR NEXT TIME
4954  024422                                  GEDF    EM48A,ERR48     ;  AND PRINT COMPLETE ERROR MESSAGE
4955                                                                  ;       'DEVICE FATAL'' ERROR # 25
4956  024422  104455                                                                  TRAP    C$ERDF
4957  024424  000031                                                                  .WORD   25
4958  024426  016016                                                                  .WORD   EM48A
4959  024430  007632                                                                  .WORD   ERR48
4960  024432  000405                          BR      12$             ;PROCEED WITH TESTING
4961  024434  012737  000002  002476  42$:    MOV     #BIT1,TMPF      ;INDICATE A 'PRE'' WRITE ERROR
4962  024442  004737  010030                  JSR     PC,ERR48.       ;USE ERROR HANDLER ONLY -- NO HEADER
4963
4964                          ;---------- WRITE NEW DATA ----------------------------------------------
4965
4966  024446  013737  002464  024460  12$:    MOV     TMPA,44$        ;GET THIS ADDRESS FOR THIS WRITE CALL
4967  024454  004537  004310                  JSR     R5,WRITE        ;WRITE THE UPDATED DATA IN THIS LOCATION
4968  024460  000000                  44$:    .WORD   0
4969  024462  002451                          TMP4+1                  ;NEW DATA ELEMENT RESIDES IN TMPD+1
4970  024464  103003                          BCC     .+10            ;IF NO ERROR, PROCEED
4971  024466                                  ERROR                   ;ELSE, REPORT IT
4972  024466  104460                                                                  TRAP    C$ERROR
4973  024470                                  ESCAPE  TST             ;       AND EXIT THIS TEST
4974  024470  104410                                                                  TRAP    C$ESCAPE
4975  024472  000420                                                                  .WORD   L10040-.
4976
4977                          ;---------- RE-'READ CURRENT ADDRESS'' ----------------------------------
4978
4979  024474  013737  002464  024506          MOV     TMPA,46$        ;GET ADDRESS FOR THIS READ
4980  024502  004537  004064                  JSR     R5,READ         ;READ DATA JUST WRITTEN
4981  024506  000000                  46$:    .WORD   0
4982  024510  002452                          TMP5
4983  024512  103003                          BCC     .+10            ;IF NO ERROR, PROCEED
4984  024514                                  ERROR                   ;ELSE, REPORT IT
4985  024514  104460                                                                  TRAP    C$ERROR
4986  024516                                  ESCAPE  TST             ;       AND EXIT THIS TEST
4987  024516  104410                                                                  TRAP    C$ESCAPE
4988  024520  000372                                                                  .WORD   L10040-.
4989
4990                          ;---------- CHECK NEW DATA VALUE ----------------------------------------
4991
4992  024522  000240                          NOP
4993  024524  000240                          NOP
4994  024526  123737  002451  002452          CMPB    TMP4+1,TMP5     ;DID THE WRITE WORK CORRECTLY?
4995  024534  001421                          BEQ     14$             ;YES,  PROCEED WITH TESTING
4996  024536  032737  000006  002476          BIT     #BIT1+BIT2,TMPF ;NO,  HAS AN ERROR ALREADY BEEN REPORTED?
4997  024544  001010                          BNE     48$             ;YES, ONLY USE ERROR HANDLER -- NO HEADER PLEASE
4998  024546  012737  000004  002476          MOV     #BIT2,TMPF      ;NO,  INDICATE THAT WE'RE PRINTING A HEADER HERE
4999  024554                                  GEDF    EM48A,ERR48     ;REPORT RE-WRITE ERROR
5000                                                                  ;       'DEVICE FATAL'' ERROR # 26
5001  024554  104455                                                                  TRAP    C$ERDF
5002  024556  000032                                                                  .WORD   26
5003  024560  016016                                                                  .WORD   EM48A
5004  024562  007632                                                                  .WORD   ERR48
5005  024564  000405                          BR      14$             ;PROCEED WITH TESTING
5006
5007  024566  012737  000004  002476  48$:    MOV     #BIT2,TMPF      ;INDICATE A 'POST'' WRITE ERROR
5008  024574  004737  010030                  JSR     PC,ERR48.       ;JUST REPORT DATA -- NO HEADER
```

```
5009
5010                                    ;---------- 'FORWARD SEQUENCE ?'' ----------------------------------------
5011
5012  024600  000240                    14$:    NOP
5013  024602  005737  002472                    TST     TMPD            ;CHECK DIRECTION -- 0 = FORWARD
5014  024606  001056                            BNE     26$             ;REVERSE ===> PROCESS REVERSE ADDRESSING
5015                                            ;FORWARD
5016
5017                                    ;---------- PROCESS FORWARD SEQUENCE -- 'LAST ADDRESS'' ----------------------
5018
5019  024610  000240                    16$:    NOP
5020  024612  023737  002464  002474            CMP     TMPA,TMPE       ;WAS THIS ADDR. THE LAST ONE?
5021  024620  001413                            BEQ     18$             ;YES, THEN CHECK THE BIT POSITION
5022  024622  005237  002464            50$:    INC     TMPA            ;NO,  THEN INCREMENT THE ADDR.
5023
5024                                    ;  HERE WE MAKE SURE THE ADDRESS IS NOT WITHIN THE SELECT REGISTER AREA.  IF IT
5025                                    ;  IS, WE WON'T USE IT -- BUT GO BACK AND DECREMENT TO THE NEXT ADDRESS AGAIN.
5026
5027  024626  022737  000020  002464    51$:    CMP     #SLTO,TMPA      ;IS IT BELOW THE AREA WE CAN'T CHECK?
5028  024634  101237                            BHI     10$             ;YES, THEN WE CAN CHECK THIS LOCATION -- DO IT
5029  024636  023737  002440  002464            CMP     TMPO,TMPA       ;IS IT BELOW THE BOTTOM ADDRESS?
5030  024644  101633                            BLOS    10$             ;NO,  TEST THIS LOCATION
5031  024646  000765                            BR      50$             ;YES, PERFORM THE INCREMENT AGAIN
5032
5033                                    ;---------- 'FWD'' SEQUENCE -- 'LAST BIT POSITION?'' ------------------------
5034
5035  024650  000240                    18$:    NOP
5036  024652  005037  010024                    CLR     ER48CT          ;RESET ERROR PRINT COUNT
5037  024656  023727  002466  000007            CMP     TMPB,#7         ;DID WE JUST PROCESS THE LAST BIT POSITION?
5038  024664  002016                            BGE     20$             ;YES, THEN WERE WE DOING 1'S OR 0'S
5039  024666  005237  002466                    INC     TMPB            ;NO,  THEM INCREMENT THE BIT COUNTER
5040  024672  005037  002464            24$:    CLR     TMPA            ;RE-INITIALIZE ADDRESS POINTER
5041  024676  113737  002451  002450    57$:    MOVB    TMP4+1,TMP4     ;USE 'NEXT'' DATA AS ''CURRENT'' DATA
5042  024704  013700  002470                    MOV     TMPC,R0         ;USE ONE BIT OF THE 'DATA'' SWITCH TO
5043  024710  006000                            ROR     R0
5044  024712  106137  002451                    ROLB    TMP4+1          ;BUILD A NEW 'NEXT'' DATA VALUE
5045  024716  000137  024334            55$:    JMP     10$             ;       & TEST IT
5046
5047                                    ;---------- 'FWD'' SEQUENCE -- 'DATA = 1?'' ----------------------------------
5048
5049  024722  000240                    20$:    NOP
5050  024724  005037  002466                    CLR     TMPB            ;POINT TO BIT 0,
5051  024730  005137  002470                    COM     TMPC            ;SWITCH DATA.  IF 1'S, DO 0'S;  IF 0'S DO 1'S
5052  024734  001756                            BEQ     24$             ;IF WENT TO FORWARD, .....
5053  024736  005137  002472                    COM     TMPD            ;SWITCH DIRECTION
5054  024742  000755                            BR      57$             ;ELSE, BACKWARD.....
5055
5056                                    ;---------- 'BKWD'' SEQUENCE -- ''ADDRESS = 0?'' ----------------------------
5057
5058  024744  000240                    26$:    NOP
5059  024746  005737  002464                    TST     TMPA            ;HAVE WE JUST PROCESSED THE FIRST ADDRESS?
5060  024752  001413                            BEQ     28$             ;YES,  CHECK BIT POSITION
5061  024754  005337  002464            52$:    DEC     TMPA            ;NO,   DECREMENT THE ADDRESS
5062
5063                                    ;  HERE WE MAKE SURE THE ADDRESS IS NOT WITHIN THE SELECT REGISTER AREA.  IF IT
5064                                    ;  IS, WE WON'T USE IT -- BUT GO BACK AND DECREMENT TO THE NEXT ADDRESS AGAIN.
```

```
5065
5066  024760  022737  000020  002464  56$:    CMP     #SLTO,TMPA      ;IS IT BELOW THE AREA WE CAN'T CHECK?
5067  024766  101031                          BHI     58$             ;YES, THEN WE CAN CHECK THIS LOCATION -- DO IT
5068  024770  023737  002440  002464          CMP     TMPO,TMPA       ;IS IT BELOW THE BOTTOM ADDRESS?
5069  024776  101425                          BLOS    58$             ;NO,  TEST THIS LOCATION
5070  025000  000765                          BR      52$             ;YES, PERFORM THE DECREMENT AGAIN
5071
5072                                  ;---------- 'BKWD'' SEQUENCE -- 'LAST BIT POSITION' ----------
5073
5074  025002  000240                  28$:    NOP
5075  025004  005037  010024                  CLR     ER48CT          ;RESET ERROR PRINT COUNT
5076  025010  022737  000007  002466          CMP     #7,TMPB         ;LAST BIT POSITION?
5077  025016  003417                          BLE     30$             ;YES, CHECK DATA
5078  025020  005237  002466                  INC     TMPB            ;NO,  INCREMENT BIT POINTER,
5079  025024  113737  002451  002450  29$:    MOVB    TMP4+1,TMP4     ;USE 'NEXT'' DATA AS 'CURRENT'' DATA
5080  025032  013700  002470                  MOV     TMPC,R0         ;USE ONE BIT OF THE 'DATA'' SWITCH TO
5081  025036  006000                          ROR     R0
5082  025040  106137  002451                  ROLB    TMP4+1          ;BUILD A NEW 'NEXT'' DATA VALUE
5083  025044  013737  002474  002464          MOV     TMPE,TMPA       ;       POINT TO LAST ADDRESS AGAIN,
5084  025052  000137  024334          58$:    JMP     10$             ;       & TEST IT
5085
5086                                  ;---------- 'BKWD'' SEQUENCE -- 'DATA = 1?'' ----------
5087
5088  025056  000240                  30$:    NOP
5089  025060  005137  002470                  COM     TMPC            ;SWITCH DATA TYPE
5090  025064  001003                          BNE     32$             ;NOW 1'S -- CHECK ADDRESS'S 'LSB''
5091  025066  005037  002466                  CLR     TMPB            ;NOW 0'S -- POINT TO BIT POSITION 0 AGAIN
5092  025072  000754                          BR      29$             ;       RESET ADDRESS & TEST IT
5093
5094
5095                                  ;---------- 'STOP'' ----------
5096
5097  025074  000240                  32$:    NOP
5098  025076  004537  004322          38$:    JSR     R5,WRITEI       ;CLEAR RAM LOCATION 0083 (HEX) & EXIT
5099  025102  000173                          173                     ;       (THIS CONVERTS TO 0083 HEX.)
5100  025104  000000                          0                       ;       (THIS WE HOPE, WILL CLEAR IT)
5101  025106  103001                          BCC     .+4             ;IF NO ERROR, PROCEED
5102  025110                                  ERROR                   ;ELSE, REPORT IT
5103  025110  104460                                                          TRAP    C$ERROR
5104  025112                                  ENDTST                  ;THATS ALL FOLKS!
5105  025112                                                                  L10040:
5106  025112  104401                                                          TRAP    C$ETST
5107                                  ;=============================================================================
5108                                  .EVEN
```

```
                        TEST 11 -- VIA REGISTER ADRESSING

                        .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
                                                                                T11::
025114
025114  004737  003762          JSR     PC,MSTCLR       ;INIT DMV AND START UP THE MAINT. LOOP
025120  103002                  BCC     1$              ;IF NO ERROR, PROCEED
025122                          ERROR                   ;ELSE,  REPORT IT AND
025122  104460                                                          TRAP    C$ERROR
025124  000546                  BR      25$             ;       EXIT THIS CLEAR
                        ;
025126  004537  004322  1$:     JSR     R5,WRITEI       ;CLEAR THE TIMER 1 LATCHES
025132  120006                  T1LL
025134  000000                  0
025136  103002                  BCC     30$             ;IF AN ERROR OCCURED,
025140                          ERROR                   ;REPORT IT &
025140  104460                                                          TRAP    C$ERROR
025142  000537                  BR      25$             ;  EXIT
025144  004537  004322  30$:    JSR     R5,WRITEI
025150  120007                  T1LH
025152  000000                  0
025154  103002                  BCC     31$             ;IF AN ERROR OCCURED,
025156                          ERROR                   ;REPORT IT &
025156  104460                                                          TRAP    C$ERROR
025160  000530                  BR      25$             ;  EXIT
                        ;
                        ; LOAD UP THE VIA'S REGISTERS WITH THE FIXED DATA STREAM OF PATTERN 'C''
                        ;
025162  013703  002556  31$:    MOV     PATC,R3         ;GET COUNT OF # OF WRITES TO BE PERFORMED
025166  012702  002560          MOV     #PATC+2,R2      ;SETUP POINTER TO REGISTER ADDRESSES & DATA
```

```
5165
5166  025172  012737  120000  025214  2$:     MOV     #ORB,4$          ;ADDRESS OF FIRST REGISTER
5167  025200  152237  025214                  BISB    (R2)+,4$         ;OR IN REGISTER # TO BUILD REGISTER ADDRESS
5168  025204  112237  025216                  MOVB    (R2)+,5$         ;THIS IS THE DATA WE WANT TO WRITE
5169
5170  025210  004537  004322                  JSR     R5,WRITEI        ;WRITE ONE REGISTER WITH THE DESIRED DATA
5171  025214  000000                  4$:     0                        ;*** MODIFIED FROM ABOVE ***  DESTINATION ADDR.
5172  025216  000000                  5$:     0                        ;*** MODIFIED FROM ABOVE ***  DATA
5173
5174  025220  103002                          BCC     32$              ;IF AN ERROR OCCURED,
5175  025222                                  ERROR                    ;REPORT IT &
5176  025222  104460                                                                   TRAP    C$ERROR
5177  025224  000506                          BR      25$              ;  EXIT
5178  025226  077317                  32$:    SOB     R3,2$            ;LOOP UNTIL THE WHOLE TABLE HAS BEEN WRITTEN
5179
5180                                  ; READ BACK THE VIA'S REGISTERS
5181
5182  025230  012703  000020                  MOV     #PATCM-PATCR,R3  ;GET COUNT OF # OF REG'S TO BE READ
5183  025234  012737  120000  025254          MOV     #ORB,7$          ;ADDRESS OF FIRST REGISTER
5184  025242  012737  003122  025256          MOV     #BT1,8$          ;DESTINATION BUFFER AREA
5185
5186  025250  004537  004064          6$:     JSR     R5,READ          ;READ ONE REGISTER
5187  025254  000000                  7$:     0                        ;*** MODIFIED FROM ABOVE ***  SOURCE ADDRESS
5188  025256  000000                  8$:     0                        ;*** MODIFIED IN LINE *** DESTINATION ADDRESS
5189  025260  103002                          BCC     33$              ;IF AN ERROR OCCURED,
5190  025262                                  ERROR                    ;REPORT IT &
5191  025262  104460                                                                   TRAP    C$ERROR
5192  025264  000466                          BR      25$              ;  EXIT
5193
5194  025266  005237  025254          33$:    INC     7$               ;POINT TO NEXT REGISTER
5195  025272  005237  025256                  INC     8$               ;POINT TO NEXT BUFFER LOCATION
5196  025276  077314                          SOB     R3,6$            ;LOOP UNTIL ALL REGISTERS HAVE BEEN READ
5197
5198                                  ; CHECK THE VALUES READ AGAINST THE EXPECTED VALUES
5199
5200  025300  012701  002604                  MOV     #PATCR,R1        ;POINTER TO EXPECTED DATA VALUES
5201  025304  012702  003122                  MOV     #BT1,R2          ;POINTER TO DATA READ
5202  025310  012704  003206                  MOV     #BT2,R4          ;POINTER TO 'XOR' VALUES
5203  025314  012705  002624                  MOV     #PATCM,R5        ;POINTER TO 'MASK' VALUES
5204  025320  012703  000010                  MOV     #8.,R3           ;NUMBER OF WORDS TO BE PROCESSED
5205  025324  005037  002332                  CLR     ERRFLG           ;RESET THE ERROR FLAG
5206
5207  025330  012114                  9$:     MOV     (R1)+,(R4)       ;GET EXPECTED VALUE (2 BYTES AT A TIME)
5208  025332  012200                          MOV     (R2)+,R0         ;GET ACTUAL VALUE AND SETUP FOR 'XOR'
5209  025334  074014                          XOR     R0,(R4)          ;DEVELOPE 'XOR'
5210  025336  042524                          BIC     (R5)+,(R4)+      ;CLEAR THOSE BITS WE DON'T CARE ABOUT
5211  025340  001402                          BEQ     10$              ;IF NO ERROR, SKIP NEXT INSTRUCTION
5212  025342  005237  002332                  INC     ERRFLG           ;IF ERROR,  SET FLAG TO SAY SO!
5213  025346  077310                  10$:    SOB     R3,9$            ;LOOP UNTIL ALL VALUES CHECKED
5214
5215  025350  005737  002332                  TST     ERRFLG           ;WAS THERE AN ERROR DETECTED?
5216  025354  001406                          BEQ     12$              ;NO,  PROCEED WITH TESTING
5217  025356                                  GEDF    EM20,ERR6        ;YES, REPORT A VIA REGISTER ERROR
5218                                                                   ;       'DEVICE FATAL'' ERROR # 27
5219  025356  104455                                                                   TRAP    C$ERDF
5220  025360  000033                                                                   .WORD   27
```

```
5221  025362  015243                                                          .WORD   EM20
5222  025364  005650                                                          .WORD   ERR6
5223  025366                      ESCAPE  TST         ;EXIT FROM THIS TEST -- LOOP IF REQUESTED
5224  025366  104410                                                          TRAP    C$ESCAPE
5225  025370  000344                                                          .WORD   L10041-.
5226
5227
5228
5229  025372  004537  004176  12$:  JSR     R5,READI    ;GET THE CURRENT VALUE OF THE VIA'S
5230  025376  120003              DDRA                    ;   'DDRA'' REGISTER FOR LATER ERROR CHECKING
5231  025400  000000        15$:  0
5232  025402  103002              BCC     34$         ;IF AN ERROR OCCURED,
5233  025404                      ERROR               ;REPORT IT &
5234  025404  104460                                                          TRAP    C$ERROR
5235  025406  000415              BR      25$         ;  EXIT
5236  025410  004537  004322  34$:  JSR     R5,WRITEI   ;LOAD DDRB WITH 000
5237  025414  120002              DDRB
5238  025416  000000              0
5239  025420  103002              BCC     35$         ;IF AN ERROR OCCURED,
5240  025422                      ERROR               ;REPORT IT &
5241  025422  104460                                                          TRAP    C$ERROR
5242  025424  000406              BR      25$         ;  EXIT
5243  025426  004537  004064  35$:  JSR     R5,READ     ;READ IT BACK AND CHECK IT
5244  025432  120002              DDRB
5245  025434  002312              BDATA
5246  025436  103002              BCC     36$         ;IF AN ERROR OCCURED,
5247  025440                      ERROR               ;REPORT IT &
5248  025440  104460                                                          TRAP    C$ERROR
5249  025442  000534        25$:  BR      24$         ;  EXIT
5250  025444  105737  002312  36$:  TSTB    BDATA       ;THIS SHOULD NOW BE ZERO
5251  025450  001413              BEQ     14$         ;IT IS, PRECEDE TESTING
5252  025452  105037  002310              CLRB    GDATA       ;IT ISN'T!  SETUP FOR & REPORT ERROR
5253  025456  012737  000002  002334      MOV     #2,REGNUM   ;IDENTIFY THE DDRB REG.
5254  025464                              GEDF    EM21,ERR7   ;       REPORT ERROR
5255                                                          ;       'DEVICE FATAL'' ERROR # 28
5256  025464  104455                                                          TRAP    C$ERDF
5257  025466  000034                                                          .WORD   28
5258  025470  015442                                                          .WORD   EM21
5259  025472  006612                                                          .WORD   ERR7
5260  025474                      ESCAPE TST          ;EXIT FROM THIS TEST -- LOOP IF REQUESTED
5261  025474  104410                                                          TRAP    C$ESCAPE
5262  025476  000236                                                          .WORD   L10041-.
5263
5264  025500  113737  025400  002310  14$:  MOVB    15$,GDATA   ;THIS IS WHAT WE EXPECT TO READ NOW
5265  025506  004537  004064              JSR     R5,READ     ;READ BACK DDRA -- IT SHOULD BE = 366
5266  025512  120003              DDRA
5267  025514  002312              BDATA
5268  025516  103002              BCC     37$         ;IF AN ERROR OCCURED,
5269  025520                      ERROR               ;REPORT IT &
5270  025520  104460                                                          TRAP    C$ERROR
5271  025522  000504              BR      24$         ;  EXIT
5272  025524  123737  002310  002312  37$:  CMPB    GDATA,BDATA ;IS IT REALLY A 377?
5273  025532  001411              BF      16$         ;YES, PROCEED WITH TESTING
5274  025534  012737  000003  002334      MOV     #3,REGNUM   ;IDENTIFY THE DDRA REG.
5275  025542                              GEDF    EM22,ERR7   ;NO,    REPORT ERROR
5276                                                          ;       'DEVICE FATAL'' ERROR # 29
```

```
                                                                                    TRAP    C$ERDF
                                                                                    .WORD   29
                                                                                    .WORD   EM22
                                                                                    .WORD   ERR7
                        ESCAPE TST              ;EXIT FROM THIS TEST -- LOOP IF REQUESTED
                                                                                    TRAP    C$ESCAPE
                                                                                    .WORD   L10041-.

16$:    JSR     R5,WRITEI       ;RE-LOAD DDRB WITH 377
        DDRB
17$:    -1
        BCC     38$             ;IF AN ERROR OCCURED,
        ERROR                   ;REPORT IT &
                                                                                    TRAP    C$ERROR
        BR      24$             ;  EXIT
38$:    JSR     R5,WRITEI       ;AND NOW CLEAR DDRA TO ZEROS
        DDRA
        0
        BCC     39$             ;IF AN ERROR OCCURED,
        ERROR                   ;REPORT IT &
                                                                                    TRAP    C$ERROR
        BR      24$             ;  EXIT

39$:    JSR     R5,READ         ;NOW, DID DDRA GO TO ZEROES
        DDRA
        BDATA
        TSTB    BDATA
        BEQ     18$             ;YES, BUT WHAT ABOUT DDRB?
        CLRB    GDATA           ;NO,  SETUP FOR AND
        MOV     #3,REGNUM       ;IDENTIFY THE DDRA REG.
        GEDF    EM21,ERR7       ;       REPORT THE ERROR
                                ;       'DEVICE FATAL'' ERROR # 30
                                                                                    TRAP    C$ERDF
                                                                                    .WORD   30
                                                                                    .WORD   EM21
                                                                                    .WORD   ERR7
        ESCAPE  TST             ;EXIT FROM THIS TEST -- LOOP IF REQUESTED
                                                                                    TRAP    C$ESCAPE
                                                                                    .WORD   L10041-.

18$:    JSR     R5,READ         ;WHAT ABOUT DDRB -- IT SHOULD BE 377 NOW
        DDRB
        BDATA
        BCC     40$             ;IF AN ERROR OCCURED,
        ERROR                   ;REPORT IT &
                                                                                    TRAP    C$ERROR
        BR      24$             ;  EXIT
40$:    CMPB    BDATA,17$       ;IS IT?
        BEQ     24$             ;YES, EXIT TEST
        MOVB    17$,GDATA       ;NO,  SETUP FOR AND
        MOV     #2,REGNUM       ;IDENTIFY THE DDRB REG.
        GEDF    EM22A,ERR7      ;       REPORT ERROR
                                ;       'DEVICE FATAL'' ERROR # 31
                                                                                    TRAP    C$ERDF
                                                                                    .WORD   31
                                                                                    .WORD   EM22A
```

```
5333  025726  006612                                                    .WORD   ERR7
5334  025730                  ESCAPE  TST          ;EXIT FROM THIS TEST -- LOOP IF REQUESTED
5335  025730  104410                                                    TRAP    C$ESCAPE
5336  025732  000002                                                    .WORD   L10041-.
5337
5338  025734          24$:    ENDTST
5339  025734                                                    L10041:
5340  025734  104401                                                    TRAP    C$ETST
```

```
                                .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
                                                                                        T12::
025736                                  JSR     PC,MSTCLR       ;INIT DMV & START UP THE MAINT. LOOP
025736  004737  003762                  BCC     30$             ;IF AN ERROR OCCURED,
025742  103003                          ERROR                   ;REPORT IT &
025744                                                                          TRAP    C$ERROR
025744  104460                          ESCAPE  TST             ;  EXIT
025746                                                                          TRAP    C$ESCAPE
025746  104410                                                                  .WORD   L10042-.
025750  000046
                                
025752  012701  002526          30$:    MOV     #PATB,R1        ;POINT TO PATTERN TABLE
025756  012103                          MOV     (R1)+,R3        ;GET # OF ENTRIES IN TABLE
                                
025760                          T12.LP:
                                        BGNSUB                  ;THE SUBTEST ONLY TESTS THE ONE PATTERN
                                                                                        T12.1:
025760  104402                                                                  TRAP    C$BSUB
                                
025762  111137  002306                  MOVB    (R1),TDATA      ;SETUP TEST DATA BYTE FOR 'STREG'
025766  112137  002310                  MOVB    (R1)+,GDATA     ;SETUP EXPECTED DATA BYTE FOR 'STREG'
025772  012700  120002                  MOV     #DDRB,R0        ;SPECIFY THE REGISTER BEING TESTED
025776  004737  005034                  JSR     PC,STREG        ;PERFORM STATIC TEST OF THE SPECIFIED REGISTER
026002  103003                          BCC     10$             ;WAS AN ERROR FOUND?
026004                                  ERROR                   ;YES, REPORT IT AND
026004  104460                                                                  TRAP    C$ERROR
026006                                  ESCAPE  TST             ;       EXIT FROM THE TEST.  ''CKLOOP'' IS IMPLIED
026006  104410                                                                  TRAP    C$ESCAPE
026010  000006                                                                  .WORD   L10042-.
                                
026012                          10$:    ENDSUB
                                                                                L10043:
026012  104403                                                                  TRAP    C$ESUB
                                
026014  077317                          SOB     R3,T12.LP       ;IF THERE IS IN FACT MORE DATA, LOOP BACK TO
                                                                ;TEST IT.  ELSE, FALL OUT OF LOOP AND TEST
                                
026016                                  ENDTST
                                                                                L10042:
026016  104401                                                                  TRAP    C$ETST
```

```
                                        .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
026020                                                                                  T13::
026020  004737  003762                          JSR     PC,MSTCLR       ;INIT DMV & START UP THE MAINT. LOOP
026024  103003                                  BCC     30$             ;IF AN ERROR OCCURED,
026026                                          ERROR                   ;REPORT IT &
026026  104460                                                                                  TRAP    C$ERROR
026030                                          ESCAPE  TST             ;  EXIT
026030  104410                                                                                  TRAP    C$ESCAPE
026032  000046                                                                                  .WORD   L10044-.

026034  012701  002526                  30$:    MOV     #PATB,R1        ;POINT TO PATTERN TABLE
026040  012103                                  MOV     (R1)+,R3        ;GET # OF ENTRIES IN TABLE

026042                                  T13.LP:
026042                                          BGNSUB                  ;THE SUBTEST ONLY TESTS THE ONE PATTERN
026042                                                                                  T13.1:
026042  104402                                                                                  TRAP    C$BSUB

026044  111137  002306                          MOVB    (R1),TDATA      ;SETUP TEST DATA BYTE FOR 'STREG''
026050  112137  002310                          MOVB    (R1)+,GDATA     ;SETUP EXPECTED DATA BYTE FOR 'STREG''
026054  012700  120003                          MOV     #DDRA,R0        ;SPECIFY THE REGISTER BEING TESTED
026060  004737  005034                          JSR     PC,STREG        ;PERFORM STATIC TEST OF THE SPECIFIED REGISTER
026064  103003                                  BCC     10$             ;WAS AN ERROR FOUND?
026066                                          ERROR                   ;YES, REPORT IT AND
026066  104460                                                                                  TRAP    C$ERROR
026070                                          ESCAPE  TST             ;     EXIT FROM THE TEST.  'CKLOOP'' IS IMPLIED
026070  104410                                                                                  TRAP    C$ESCAPE
026072  000006                                                                                  .WORD   L10044-.

026074                                  10$:    ENDSUB
026074                                                                                  L10045:
026074  104403                                                                                  TRAP    C$ESUB

026076  077317                                  SOB     R3,T13.LP       ;IF THERE IS IN FACT MORE DATA, LOOP BACK TO
                                                                        ;TEST IT.  ELSE, FALL OUT OF LOOP AND TEST

026100                                          ENDTST
026100                                                                                  L10044:
026100  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
026102                                                                            T14::
026102  004737  003762                    JSR     PC,MSTCLR       ;INIT DMV & START UP THE MAINT. LOOP
026106  103003                            BCC     30$             ;IF AN ERROR OCCURED,
026110                                    ERROR                   ;REPORT IT &
026110  104460                                                                      TRAP    C$ERROR
026112                                    ESCAPE  TST             ;  EXIT
026112  104410                                                                      TRAP    C$ESCAPE
026114  000066                                                                      .WORD   L10046-.

026116  004537  004322            30$:    JSR     R5,WRITEI       ;INITIALIZE PORT B FOR I/O
026122  120002                            DDRB
026124  177777                            -1
026126  103003                            BCC     31$             ;IF AN ERROR OCCURED,
026130                                    ERROR                   ;REPORT IT &
026130  104460                                                                      TRAP    C$ERROR
026132                                    ESCAPE  TST             ;  EXIT
026132  104410                                                                      TRAP    C$ESCAPE
026134  000046                                                                      .WORD   L10046-.

026136  012701  002526            31$:    MOV     #PATB,R1        ;POINT TO PATTERN TABLE
026142  012103                            MOV     (R1)+,R3        ;GET # OF ENTRIES IN TABLE

026144                            T14.LP:
026144                                    BGNSUB                  ;THE SUBTEST ONLY TESTS THE ONE PATTERN
026144                                                                        T14.1:
026144  104402                                                                      TRAP    C$BSUB

026146  111137  002306                    MOVB    (R1),TDATA      ;SETUP TEST DATA BYTE FOR ''STREG''
026152  112137  002310                    MOVB    (R1)+,GDATA     ;SETUP EXPECTED DATA BYTE FOR ''STREG''
026156  012700  120000                    MOV     #ORB,R0         ;SPECIFY THE REGISTER BEING TESTED
026162  004737  005034                    JSR     PC,STREG        ;PERFORM STATIC TEST OF THE SPECIFIED REGISTER
026166  103003                            BCC     10$             ;WAS AN ERROR FOUND?
026170                                    ERROR                   ;YES, REPORT IT AND
026170  104460                                                                      TRAP    C$ERROR
026172                                    ESCAPE  TST             ;     EXIT FROM THE TEST.  ''CKLOOP'' IS IMPLIED
026172  104410                                                                      TRAP    C$ESCAPE
026174  000006                                                                      .WORD   L10046-.
```

```
5506 026176                 10$:    ENDSUB
5507 026176                                                                 L10047:
5508 026176 104403                                                                  TRAP    C$ESUB
5509
5510 026200 077317                  SOB     R3,T14.LP       ;IF THERE IS IN FACT MORE DATA, LOOP BACK TO
5511                                                        ;TEST IT.  ELSE, FALL OUT OF LOOP AND TEST
5512
5513 026202                         ENDTST
5514 026202                                                                 L10046:
5515 026202 104401                                                                  TRAP    C$ETST
```

```
.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.
```

```
5572                    ;* D. T1L-L(ADR 06) IS READ AND COMPARED TO 000.
5573                    ;* E. STEPS B-D ARE REPEATED USING EACH BYTE OF DATA PATTERN B.
5574                    ;*
5575                    ;*   DATA PATTERN B = 125, 252, 000, 377, 001, 002, 004, 010, 020, 040, 100,
5576                    ;*                    200, 376, 375, 373, 367, 357, 337, 277, 177, 000
5577                    ;*
5578                    ;*--------------------------------------------------------------------------------
5579                    ;
5580                    ;       BGNTST
5581  026204                                                                    T15::
5582
5583                    ; ********** STEP A **********
5584
5585  026204  004737  003762        JSR     PC,MSTCLR       ;INIT DMV & START UP M-LOOP
5586  026210  103003                BCC     1$              ;IF NO ERRORS, PROCEED
5587  026212                        ERROR                   ;ELSE, REPORT ERROR &
5588  026212  104460                                                            TRAP    C$ERROR
5589  026214                        ESCAPE  TST             ;       GET OUT OF THE TEST
5590  026214  104410                                                            TRAP    C$ESCAPE
5591  026216  001030                                                            .WORD   L10050-.
5592  026220                1$:
5593
5594                    ; ********** STEP B **********
5595
5596  026220  004537  004660        JSR     R5,INITT1       ;INITIALIZE THE TIMER'S REGISTERS
5597  026224  000000                0                       ; WITH ZEROES
5598  026226  000000                .WORD   0               ; 00 --> ACR6 & ACR7 AND DISABLE INTERRUPTS
5599  026230  103003                BCC     .+10            ;IF NO ERROR, PROCEED
5600  026232                        ERROR                   ;ELSE, REPORT IT
5601  026232  104460                                                            TRAP    C$ERROR
5602  026234                        ESCAPE  TST             ;       AND EXIT THIS TEST
5603  026234  104410                                                            TRAP    C$ESCAPE
5604  026236  001010                                                            .WORD   L10050-.
5605
5606                    ;WE WANT THE LEAST ACTIVE OPERATING MODE FOR THIS TIMER WHILE WE ARE TESTING
5607                    ;IT.  THE MODE WE'RE USING HERE IS DOCUMENTED THUSLY:  'GENERATE A SINGLE
5608                    ;TIME-OUT INTERRUPT EACH TIME T1 IS LOADED.  PB7 DISABLED.''
5609                    ;AS AN ADDED PRECAUTION, WE ARE DISABLING INTERRUPTS BY CLEARING THE 'T1'' FLAG
5610                    ;WITHIN ''IER''.
5611
5612  026240                        BGNSUB                  ;BEGIN THE FIRST SUBTEST
5613  026240                                                                    T15.1:
5614  026240  104402                                                            TRAP    C$BSUB
5615  026242  012701  002526        MOV     #PATB,R1        ;POINT TO THE APPROPRIATE PATTERN TABLE
5616  026246  012103                MOV     (R1)+,R3        ;EXTRACT THE BYTE COUNT FROM THE TABLE
5617
5618  026250                T16.LP:
5619  026250  112137  002306        MOVB    (R1)+,TDATA     ;GET ONE BYTE OF THE TEST DATA
5620  026254  013737  002306  002310  MOV     TDATA,GDATA     ;THE TEST DATA IS NORMALLY THE GOOD DATA TOO
5621
5622  026262                        BGNSEG
5623  026262  104404                                                            TRAP    C$BSEG
5624
5625                    ; ********** STEP C **********
5626
5627  026264  004537  004310        JSR     R5,WRITE        ;LOAD T1L-L(ADDR 04)
```

```
5628  026270  120004                        T1CL
5629  026272  002306                        TDATA                   ;THE TEST DATA FROM 'TDATA''
5630
5631
5632                                  ; ***----*** STEP D ***----***
5633
5634  026274  004537  004064                JSR     R5,READ         ;READ T1L-L(ADDR 06)
5635  026300  120006                        T1LL
5636  026302  002312                        BDATA
5637  026304  123737  002310  002312        CMPB    GDATA,BDATA     ;AND CHECK IT
5638  026312  001407                        BEQ     2$              ;IF OK, PROCEED
5639  026314  012737  000006  002334        MOV     #6,REGNUM       ;IDENTIFY THE FAILING REGISTER &
5640  026322                                GEDF    EM20,ERR7       ; REPORT FAILURE
5641                                                                ;       'DEVICE FATAL'' ERROR # 32
5642  026322  104455                                                        TRAP    C$ERDF
5643  026324  000040                                                        .WORD   32
5644  026326  015243                                                        .WORD   EM20
5645  026330  006612                                                        .WORD   ERR7
5646
5647                                  ; ***----*** STEP E ***----***
5648
5649  026332  004537  004064        2$:     JSR     R5,READ         ;READ T1C-L(ADDR 04)
5650  026336  120004                        T1CL
5651  026340  002312                        BDATA
5652  026342  123737  002310  002312        CMPB    GDATA,BDATA     ;AND CHECK IT. SEEING AS THE TIMER IS RUNNING,
5653  026350  001017                        BNE     4$              ;THIS MUST NOT EQUAL THE SET VALUE!
5654  026352  004537  004064                JSR     R5,READ         ;IF IT IS, MAYBE WE JUST READ IT AT THE WRONG
5655  026356  120004                        T1CL                    ;TIME!  RE-READ AND CHECK ONE MORE TIME.
5656  026360  002312                        BDATA
5657  026362  123737  002310  002312        CMPB    GDATA,BDATA     ;CHECK IT AGAIN, SAM.
5658  026370  001007                        BNE     4$              ;THIS TIME IT SHOULD BE DIFFERENT.
5659                                                                ;OTHERWISE, WE HAVE A LEGITIMATE FAILURE
5660  026372  012737  000004  002334        MOV     #4,REGNUM       ;  IDENTIFY THE FAILING REGISTER &
5661  026400                                GEDF    EM20A,ERR7      ;  REPORT FAILURE
5662                                                                ;       'DEVICE FATAL'' ERROR # 33
5663  026400  104455                                                        TRAP    C$ERDF
5664  026402  000041                                                        .WORD   33
5665  026404  015275                                                        .WORD   EM20A
5666  026406  006612                                                        .WORD   ERR7
5667
5668                                  ; ***----*** STEP F ***----***
5669
5670  026410  105137  002306        4$:     COMB    TDATA           ;USE THE ONE'S COMPLEMENT THIS TIME
5671  026414  105137  002310                COMB    GDATA           ;THE EXPECTED DATA IS ALSO THE COMPLEMENT
5672  026420  004537  004310                JSR     R5,WRITE        ;LOAD T1L-L(ADDR 06)
5673  026424  120006                        T1LL
5674  026426  002306                        TDATA                   ;THE TEST DATA FROM 'TDATA''
5675
5676                                  ; ***----*** STEP G ***----***
5677
5678  026430  004537  004064        6$:     JSR     R5,READ         ;READ T1L-L(ADDR 06)
5679  026434  120006                        T1LL
5680  026436  002312                        BDATA
5681  026440  123737  002310  002312        CMPB    GDATA,BDATA     ;AND CHECK IT
5682  026446  001407                        BEQ     8$              ;IF OK, PROCEED
5683  026450  012737  000006  002334        MOV     #6,REGNUM       ;IDENTIFY THE FAILING REGISTER &
```

```
5684  026456                                  GEDF    EM20,ERR7       ; REPORT FAILURE
5685                                                                  ;       'DEVICE FATAL'' ERROR # 34
5686  026456  104455                                                                  TRAP    C$ERDF
5687  026460  000042                                                                  .WORD   34
5688  026462  015243                                                                  .WORD   EM20
5689  026464  006612                                                                  .WORD   ERR7
5690
5691                                  ; ********** STEP H **********
5692
5693  026466  105137  002306         8$:     COMB    TDATA           ;RESTORE THE DATA TO THE ORIGINAL VALUE
5694  026472  105137  002310                 COMB    GDATA
5695  026476  004537  004322                 JSR     R5,WRITEI       ;SET THE LOW LATCH TO MAKE SURE THE HIGH
5696  026502  120006                         T1LL                    ;COUNTER IS DOING MOST OF THE WORK
5697  026504  000001                         1
5698  026506  004537  004310                 JSR     R5,WRITE        ;LOAD T1L-H(ADDR 05)
5699  026512  120005                         T1CH
5700  026514  002306                         TDATA                   ;THE TEST DATA FROM ''TDATA''
5701
5702                                  ; ********** STEP I **********
5703
5704  026516  004537  004064                 JSR     R5,READ         ;READ T1L-H(ADDR 07)
5705  026522  120007                         T1LH
5706  026524  002312                         BDATA
5707  026526  123737  002310  002312         CMPB    GDATA,BDATA     ;AND CHECK IT
5708  026534  001407                         BEQ     10$             ;IF OK, PROCEED
5709  026536  012737  000007  002334         MOV     #7,REGNUM       ;IDENTIFY THE FAILING REGISTER &
5710  026544                                 GEDF    EM20,ERR7       ; REPORT FAILURE
5711                                                                  ;       'DEVICE FATAL'' ERROR # 35
5712  026544  104455                                                                  TRAP    C$ERDF
5713  026546  000043                                                                  .WORD   35
5714  026550  015243                                                                  .WORD   EM20
5715  026552  006612                                                                  .WORD   ERR7
5716
5717                                  ; ********** STEP J **********
5718
5719  026554  004537  004064         10$:    JSR     R5,READ         ;READ T1C-H(ADDR 05)
5720  026560  120005                         T1CH
5721  026562  002312                         BDATA
5722  026564  012737  000005  002334         MOV     #5,REGNUM       ;IDENTIFY THE REGISTER BEING CHECKED
5723  026572  105737  002306                 TSTB    TDATA           ;WAS THE TEST DATA '000'?
5724  026576  001410                         BEQ     14$             ;YES, THEN WE CAN'T BE SURE OF THE RESULTS!
5725  026600  123737  002310  002312         CMPB    GDATA,BDATA     ;NO, CHECK IT
5726  026606  001004                         BNE     14$             ;IT SHOULDN'T = THE LOADED VALUE
5727  026610                                 GEDF    EM20A,ERR7      ;IT DID!  REPORT FAILURE
5728                                                                  ;       'DEVICE FATAL'' ERROR # 36
5729  026610  104455                                                                  TRAP    C$ERDF
5730  026612  000044                                                                  .WORD   36
5731  026614  015275                                                                  .WORD   EM20A
5732  026616  006612                                                                  .WORD   ERR7
5733                                                                  ;AND CONTINUE TESTING
5734                                  ; ********** STEP K **********
5735
5736  026620  105137  002306         14$:    COMB    TDATA           ;USE THE ONE'S COMPLEMENT THIS TIME
5737  026624  105137  002310                 COMB    GDATA           ;THE EXPECTED DATA IS ALSO THE COMPLEMENT
5738  026630  004537  004310                 JSR     R5,WRITE        ;LOAD T1L-H(ADDR 07)
5739  026634  120007                         T1LH
```

```
5740  026636  002306                          TDATA                   ;THE TEST DATA FROM 'TDATA'
5741
5742                                  ; ***---*** STEP L ***---***
5743
5744  026640  004537  004064                  JSR     R5,READ         ;READ T1L-H(ADDR 07)
5745  026644  120007                          T1LH
5746  026646  002312                          BDATA
5747  026650  123737  002310  002312          CMPB    GDATA,BDATA     ;AND CHECK IT
5748  026656  001407                          BEQ     16$             ;IF OK, PROCEED
5749  026660  012737  000007  002334          MOV     #7,REGNUM       ;IDENTIFY THE FAILING REGISTER &
5750  026666                                  GEDF    EM20,ERR7       ; REPORT FAILURE
5751                                                                  ;       'DEVICE FATAL'' ERROR # 37
5752  026666  104455                                                                  TRAP    C$ERDF
5753  026670  000045                                                                  .WORD   37
5754  026672  015243                                                                  .WORD   EM20
5755  026674  006612                                                                  .WORD   ERR7
5756
5757                                  ; ***---*** STEP M ***---***
5758
5759  026676                          16$:    ENDSEG
5760  026676                                                                  10000$:
5761  026676  104405                                                                  TRAP    C$ESEG
5762
5763  026700  000402                          BR      21$
5764  026702  000137  026250          20$:    JMP     T16.LP
5765  026706  077303                  21$:    SOB     R3,20$          ;IF MORE DATA, DO ANOTHER BYTE
5766                                                                  ;ELSE, EXIT SUBTEST
5767  026710                          ENDSUB
5768  026710                                                                  L10051:
5769  026710  104403                                                                  TRAP    C$ESUB
5770
5771
5772  026712                          BGNSUB                          ;BEGIN THE SECOND SUBTEST
5773  026712                                                                  T15.2:
5774  026712  104402                                                                  TRAP    C$BSUB
5775  026714  012701  002526                  MOV     #PATB,R1        ;POINT TO THE APPROPRIATE PATTERN TABLE
5776  026720  012103                          MOV     (R1)+,R3        ;EXTRACT THE BYTE COUNT FROM THE TABLE
5777
5778  026722                          T16.L1:
5779  026722  112137  002306                  MOVB    (R1)+,TDATA     ;GET ONE BYTE OF THE TEST DATA
5780  026726  013737  002306  002310          MOV     TDATA,GDATA     ;THE TEST DATA IS NORMALLY THE GOOD DATA TOO
5781
5782
5783                                  ; ***---*** STEP A ***---***
5784
5785  026734  004537  004322                  JSR     R5,WRITEI       ;CLEAR T1L-H(ADDR 07)
5786  026740  120007                          T1LH
5787  026742  000000                          0                       ;THE TEST DATA FROM 'TDATA'
5788
5789  026744                                  BGNSEG
5790  026744  104404                                                                  TRAP    C$BSEG
5791
5792                                  ; ***---*** STEP B ***---***
5793
5794  026746  004537  004310                  JSR     R5,WRITE        ;LOAD T1L-L(ADDR 06)
5795  026752  120006                          T1LL
```

```
5796  026754  002306                        TDATA                   ;THE TEST DATA FROM 'TDATA'
5797
5798                                  ; ********** STEP C **********
5799
5800  026756  004537  004064                JSR     R5,READ         ;READ T1L-L(ADDR 06)
5801  026762  120006                        T1LL
5802  026764  002312                        BDATA
5803  026766  123737  002310  002312        CMPB    GDATA,BDATA     ;AND CHECK IT
5804  026774  001407                        BEQ     2$              ;IF OK, PROCEED
5805  026776  012737  000006  002334        MOV     #6,REGNUM       ;IDENTIFY THE FAILING REGISTER &
5806  027004                                GEDF    EM20,ERR7       ; REPORT FAILURE
5807                                                                ;       'DEVICE FATAL'' ERROR # 38
5808  027004  104455                                                                 TRAP    C$ERDF
5809  027006  000046                                                                 .WORD   38
5810  027010  015243                                                                 .WORD   EM20
5811  027012  006612                                                                 .WORD   ERR7
5812
5813                                  ; ********** STEP D **********
5814
5815  027014  004537  004064        2$:     JSR     R5,READ         ;READ T1L-H(ADDR 07)
5816  027020  120007                        T1LH
5817  027022  002312                        BDATA
5818  027024  105737  002312                TSTB    BDATA           ;AND CHECK IT -- THIS SHOULD STILL BE ZERO
5819  027030  001411                        BEQ     10$             ;IF OK, PROCEED
5820  027032  005037  002310                CLR     GDATA
5821  027036  012737  000007  002334        MOV     #7,REGNUM       ;IDENTIFY THE FAILING REGISTER &
5822  027044                                GEDF    EM20B,ERR7      ; REPORT FAILURE
5823                                                                ;       'DEVICE FATAL'' ERROR # 39
5824  027044  104455                                                                 TRAP    C$ERDF
5825  027046  000047                                                                 .WORD   39
5826  027050  015355                                                                 .WORD   EM20B
5827  027052  006612                                                                 .WORD   ERR7
5828
5829                                  ; ********** STEP E **********
5830
5831  027054                        10$:    ENDSEG
5832  027054                                                                10000$:
5833  027054  104405                                                                 TRAP    C$ESEG
5834
5835  027056  000402                        BR      21$
5836  027060  000137  026722        20$:    JMP     T16.L1
5837  027064  077303                21$:    SOB     R3,20$          ;IF MORE DATA, DO ANOTHER BYTE
5838                                                                ;ELSE, EXIT SUBTEST
5839  027066                                ENDSUB
5840  027066                                                                L10052:
5841  027066  104403                                                                 TRAP    C$ESUB
5842
5843
5844  027070                                BGNSUB                  ;BEGIN THE THIRD SUBTEST
5845  027070                                                                T15.3:
5846  027070  104402                                                                 TRAP    C$BSUB
5847  027072  012701  002526                MOV     #PATB,R1        ;POINT TO THE APPROPRIATE PATTERN TABLE
5848  027076  012103                        MOV     (R1)+,R3        ;EXTRACT THE BYTE COUNT FROM THE TABLE
5849
5850  027100                        T16.L2:
5851  027100  112137  002306                MOVB    (R1)+,TDATA     ;GET ONE BYTE OF THE TEST DATA
```

```
5852  027104  013737  002306  002310          MOV     TDATA,GDATA     ;THE TEST DATA IS NORMALLY THE GOOD DATA TOO
5853
5854
5855                                  ; ********** STEP A **********
5856
5857  027112  004537  004322                  JSR     R5,WRITEI       ;CLEAR T1L-L(ADDR 04)
5858  027116  120004                          T1CL
5859  027120  000000                          0
5860
5861  027122                                  BGNSEG
5862  027122  104404                                                                 TRAP    C$BSEG
5863
5864                                  ; ********** STEP B **********
5865
5866  027124  004537  004310                  JSR     R5,WRITE        ;LOAD T1L-H(ADDR 07)
5867  027130  120007                          T1LH
5868  027132  002306                          TDATA                   ;THE TEST DATA FROM 'TDATA'
5869
5870                                  ; ********** STEP C **********
5871
5872  027134  004537  004064                  JSR     R5,READ         ;READ T1L-H(ADDR 07)
5873  027140  120007                          T1LH
5874  027142  002312                          BDATA
5875  027144  123737  002310  002312          CMPB    GDATA,BDATA     ;AND CHECK IT
5876  027152  001407                          BEQ     10$             ;IF OK, PROCEED
5877  027154  012737  000007  002334          MOV     #7,REGNUM       ;IDENTIFY THE FAILING REGISTER &
5878  027162                                  GEDF    EM20,ERR7       ; REPORT FAILURE
5879                                                                  ;       'DEVICE FATAL'' ERROR # 40
5880  027162  104455                                                                 TRAP    C$ERDF
5881  027164  000050                                                                 .WORD   40
5882  027166  015243                                                                 .WORD   EM20
5883  027170  006612                                                                 .WORD   ERR7
5884
5885                                  ; ********** STEP D **********
5886
5887  027172  004537  004064  10$:     JSR     R5,READ         ;READ T1L-L(ADDR 06)
5888  027176  120006                          T1LL
5889  027200  002312                          BDATA
5890  027202  105737  002312                  TSTB    BDATA           ;AND CHECK IT
5891  027206  001411                          BEQ     2$              ;IF OK, PROCEED
5892  027210  005037  002310                  CLR     GDATA
5893  027214  012737  000006  002334          MOV     #6,REGNUM       ;IDENTIFY THE FAILING REGISTER &
5894  027222                                  GEDF    EM20B,ERR7      ; REPORT FAILURE
5895                                                                  ;       'DEVICE FATAL'' ERROR # 41
5896  027222  104455                                                                 TRAP    C$ERDF
5897  027224  000051                                                                 .WORD   41
5898  027226  015355                                                                 .WORD   EM20B
5899  027230  006612                                                                 .WORD   ERR7
5900
5901                                  ; ********** STEP E **********
5902
5903  027232                          2$:     ENDSEG
5904  027232                                                                  10000$:
5905  027232  104405                                                                 TRAP    C$ESEG
5906
5907  027234  000402                          BR      21$
```

```
 5908  027236  000137  027100          20$:    JMP     T16.L2
 5909  027242  077303                  21$:    SOB     R3,20$          ;IF MORE DATA, DO ANOTHER BYTE
 5910                                                                  ;ELSE, EXIT SUBTEST
 5911  027244                                  ENDSUB
 5912  027244                                                                  L10053:
 5913  027244  104403                                                                  TRAP    C$ESUB
 5914
 5915  027246                                  ENDTST
 5916  027246                                                                  L10050:
 5917  027246  104401                                                                  TRAP    C$ETST
```

CVDMAA.P11 12-DEC-80 15:59 TEST 16 -- VIA'S SR DATA READ/WRITE

```
5918                            .SBTTL TEST 16 -- VIA'S SR DATA READ/WRITE
5919
5920                            ;++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
5921                            ;*
5922                            ;*      TEST 16 -- VIA'S SR DATA READ/WRITE
5923                            ;*
5924                            ;*      SR == 'SHIFT REGISTER'
5925                            ;*
5926                            ;* FIRST, A MASTER CLEAR IS PERFORMED AND THE ACR IS SET TO 000. THEN :
5927                            ;* READ/WRITE BITS 0-7 OF VIA SHIFT REGISTER ARE TESTED BY WRITING, READING,
5928                            ;* AND COMPARING EACH BYTE OF DATA PATTERN B.
5929                            ;*   DATA PATTERN B = 125, 252, 000, 377, 001, 002, 004, 010, 020, 040, 100,
5930                            ;*                    200, 376, 375, 373, 367, 357, 337, 277, 177, 000
5931                            ;*
5932                            ;--++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
5933                            ;
5934                            ;       BGNTST
5935  027250                                                                T16::
5936  027250  004737  003762           JSR     PC,MSTCLR       ;INIT DMV & START UP THE MAINT. LOOP
5937  027254  103003                   BCC     30$             ;IF AN ERROR OCCURED,
5938  027256                           ERROR                   ;REPORT IT &
5939  027256  104460                                                   TRAP    C$ERROR
5940  027260                           ESCAPE  TST             ;  EXIT
5941  027260  104410                                                   TRAP    C$ESCAPE
5942  027262  000046                                                   .WORD   L10054-.
5943
5944  027264  012701  002526   30$:    MOV     #PATB,R1        ;POINT TO PATTERN TABLE
5945  027270  012103                   MOV     (R1)+,R3        ;GET # OF ENTRIES IN TABLE
5946
5947  027272                   T18.LP:
5948  027272                           BGNSUB                  ;THE SUBTEST ONLY TESTS THE ONE PATTERN
5949  027272                                                                T16.1:
5950  027272  104402                                                   TRAP    C$BSUB
5951
5952  027274  111137  002306           MOVB    (R1),TDATA      ;SETUP TEST DATA BYTE FOR 'STREG'
5953  027300  112137  002310           MOVB    (R1)+,GDATA     ;SETUP EXPECTED DATA BYTE FOR 'STREG'
5954  027304  012700  120012           MOV     #SR,R0          ;SPECIFY THE REGISTER BEING TESTED
5955  027310  004737  005034           JSR     PC,STREG        ;PERFORM STATIC TEST OF THE SPECIFIED REGISTER
5956  027314  103003                   BCC     10$             ;WAS AN ERROR FOUND?
5957  027316                           ERROR                   ;YES, REPORT IT AND
5958  027316  104460                                                   TRAP    C$ERROR
5959  027320                           ESCAPE  TST             ;     EXIT FROM THE TEST.  'CKLOOP' IS IMPLIED
5960  027320  104410                                                   TRAP    C$ESCAPE
5961  027322  000006                                                   .WORD   L10054-.
5962
5963  027324                   10$:    ENDSUB
5964  027324                                                        L10055:
5965  027324  104403                                                   TRAP    C$ESUB
5966
5967  027326  077317                   SOB     R3,T18.LP       ;IF THERE IS IN FACT MORE DATA, LOOP BACK TO
5968                                                           ;TEST IT.  ELSE, FALL OUT OF LOOP AND TEST
5969
5970  027330                           ENDTST
5971  027330                                                        L10054:
5972  027330  104401                                                   TRAP    C$ETST
```

```
                                  .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
027332                                                                          T17::
027332  004737  003762                  JSR     PC,MSTCLR       ;INIT DMV & START UP THE MAINT. LOOP
027336  103003                          BCC     30$             ;IF AN ERROR OCCURED,
027340                                  ERROR                   ;REPORT IT &
027340  104460                                                                      TRAP    C$ERROR
027342                                  ESCAPE  TST             ;  EXIT
027342  104410                                                                      TRAP    C$ESCAPE
027344  000046                                                                      .WORD   L10056-.

027346  012701  002526          30$:    MOV     #PATB,R1        ;POINT TO PATTERN TABLE
027352  012103                          MOV     (R1)+,R3        ;GET # OF ENTRIES IN TABLE

027354                          T19.LP:
027354                                  BGNSUB                  ;THE SUBTEST ONLY TESTS THE ONE PATTERN
027354                                                                          T17.1:
027354  104402                                                                      TRAP    C$BSUB

027356  111137  002306                  MOVB    (R1),TDATA      ;SETUP TEST DATA BYTE FOR 'STREG'
027362  112137  002310                  MOVB    (R1)+,GDATA     ;SETUP EXPECTED DATA BYTE FOR 'STREG'
027366  012700  120013                  MOV     #ACR,R0         ;SPECIFY THE REGISTER BEING TESTED
027372  004737  005034                  JSR     PC,STREG        ;PERFORM STATIC TEST OF THE SPECIFIED REGISTER
027376  103003                          BCC     10$             ;WAS AN ERROR FOUND?
027400                                  ERROR                   ;YES, REPORT IT AND
027400  104460                                                                      TRAP    C$ERROR
027402                                  ESCAPE  TST             ;     EXIT FROM THE TEST.  ''CKLOOP'' IS IMPLIED
027402  104410                                                                      TRAP    C$ESCAPE
027404  000006                                                                      .WORD   L10056-.

027406                          10$:    ENDSUB
027406                                                                          L10057:
027406  104403                                                                      TRAP    C$ESUB

027410  077317                          SOB     R3,T19.LP       ;IF THERE IS IN FACT MORE DATA, LOOP BACK TO
                                                                ;TEST IT.  ELSE, FALL OUT OF LOOP AND TEST

027412                                  ENDTST
027412                                                                          L10056:
027412  104401                                                                      TRAP    C$ETST
```

```
                        .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                                                          T18::
027414
027414  004737  003762          JSR     PC,MSTCLR       ;INIT DMV & START UP THE MAINT. LOOP
027420  103003                  BCC     30$             ;IF AN ERROR OCCURED,
027422                          ERROR                   ;REPORT IT &
027422  104460                                                          TRAP    C$ERROR
027424                          ESCAPE  TST             ;  EXIT
027424  104410                                                          TRAP    C$ESCAPE
027426  000050                                                          .WORD   L10060-.
027430  012701  002530  30$:    MOV     #PATB+2,R1      ;POINT TO PATTERN TABLE
027434  012703  002543          MOV     #PATB+15,R3     ;GET # OF ENTRIES IN TABLE
027440                  T20.LP:
027440                          BGNSUB                  ;THE SUBTEST ONLY TESTS THE ONE PATTERN
027440                                                                  T18.1:
027440  104402                                                          TRAP    C$BSUB
027442  111137  002306          MOVB    (R1),TDATA      ;SETUP TEST DATA BYTE FOR 'STREG'
027446  112137  002310          MOVB    (R1)+,GDATA     ;SETUP EXPECTED DATA BYTE FOR 'STREG'
027452  012700  120014          MOV     #PCR,R0         ;SPECIFY THE REGISTER BEING TESTED
027456  004737  005034          JSR     PC,STREG        ;PERFORM STATIC TEST OF THE SPECIFIED REGISTER
027462  103003                  BCC     10$             ;WAS AN ERROR FOUND?
027464                          ERROR                   ;YES, REPORT IT AND
027464  104460                                                          TRAP    C$EKROR
027466                          ESCAPE  TST             ;       EXIT FROM THE TEST.  'CKLOOP' IS IMPLIED
027466  104410                                                          TRAP    C$ESCAPE
027470  000006                                                          .WORD   L10060-.
027472                  10$:    ENDSUB
027472                                                                  L10061:
027472  104403                                                          TRAP    C$ESUB
027474  077317                  SOB     R3,T20.LP       ;IF THERE IS IN FACT MORE DATA, LOOP BACK TO
                                                        ;TEST IT.  ELSE, FALL OUT OF LOOP AND TEST
027476                          ENDTST
027476                                                                  L10060:
027476  104401                                                          TRAP    C$ETST
```

```
                        .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
                        ;*
                        ;*
                        ;--*************************************************************************
                        ;
027500                          BGNTST                                          T19::
027500  004737  003762          JSR     PC,MSTCLR       ;INIT DMV & START UP THE MAINT. LOOP
027504  103003                  BCC     30$             ;IF AN ERROR OCCURED,
027506                          ERROR                   ;REPORT IT &
027506  104460                                                          TRAP    C$ERROR
027510                          ESCAPE  TST             ;  EXIT
027510  104410                                                          TRAP    C$ESCAPE
027512  000052                                                          .WORD   L10062-.
027514
027514  012701  002644  30$:    MOV     #PATD,R1        ;POINT TO PATTERN TABLE
027520  012103                  MOV     (R1)+,R3        ;GET # OF ENTRIES IN TABLE
027522  012702  002676          MOV     #PATE+2,R2      ;POINT TO 'EXPECTED' DATA PATTERN TABLE
027526
027526  T21.LP:
027526                          BGNSUB                  ;THE SUBTEST ONLY TESTS THE ONE PATTERN
027526                                                                  T19.1:
027526  104402                                                          TRAP    C$BSUB
027530  112137  002306          MOVB    (R1)+,TDATA     ;SETUP TEST DATA BYTE FOR 'STREG'
027534  112237  002310          MOVB    (R2)+,GDATA     ;SETUP EXPECTED DATA BYTE FOR 'STREG'
027540  012700  120016          MOV     #IENR,R0        ;SPECIFY THE REGISTER BEING TESTED
027544  004737  005034          JSR     PC,STREG        ;PERFORM STATIC TEST OF THE SPECIFIED REGISTER
027550  103003                  BCC     10$             ;WAS AN ERROR FOUND?
027552                          ERROR                   ;YES, REPORT IT AND
027552  104460                                                          TRAP    C$ERROR
027554                          ESCAPE  TST             ;     EXIT FROM THE TEST.  ''CKLOOP'' IS IMPLIED
027554  104410                                                          TRAP    C$ESCAPE
027556  000006                                                          .WORD   L10062-.
027560
027560  10$:    ENDSUB
027560                                                          L10063:
027560  104403                                                          TRAP    C$ESUB
```

```
6138  027562  077317                SOB     R3,T21.LP       ;IF THERE IS IN FACT MORE DATA, LOOP BACK TO
6139                                                          ;TEST IT.  ELSE, FALL OUT OF LOOP AND TEST
6140
6141  027564                        ENDTST
6142  027564                                                                L10062:
6143  027564  104401                                                                TRAP    C$ETST
```

```
6144                                    .SBTTL TEST 20 -- VIA'S ORB/DDRB MASTER CLEAR TEST
6145
6146                                    ;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
6147                                    ;*
6148                                    ;*      TEST 20 -- VIA'S ORB/DDRB MASTER CLEAR TEST
6149                                    ;*
6150                                    ;*      ORB == 'OUTPUT REGISTER PORT B''
6151                                    ;*      DDRB == 'DATA DIRECTION REGISTER B''
6152                                    ;*
6153                                    ;* FIRST, A MASTER CLEAR IS PERFORMED. NEXT, 377 IS LOADED INTO DDRB TO SET
6154                                    ;* ALL B PORT PINS FOR OUTPUT MODE. THEN, A 000 BYTE IS WRITTEN INTO ORB AND
6155                                    ;* THE REGISTER IS READ BACK AND CHECKED FOR 000. THEN, A MASTER CLEAR IS
6156                                    ;* PERFORMED AND ORB IS READ AND CHECKED FOR 377.
6157                                    ;*
6158                                    ;--*************************************************************************************
6159                                    ;
6160                                    ;       BGNTST
6161  027566                                                                                    T20::
6162
6163  027566  004737  003762                    JSR     PC,MSTCLR       ;INIT DMV & START UP THE MAINT. LOOP
6164  027572  103003                    BCC     1$              ;IF AN ERROR OCCURED,
6165  027574                            ERROR                   ;REPORT IT &
6166  027574  104460                                                                            TRAP    C$ERROR
6167  027576                            ESCAPE  TST             ;  EXIT
6168  027576  104410                                                                            TRAP    C$ESCAPE
6169  027600  000252                                                                           .WORD   L10064-.
6170
6171  027602  012737  000377  002310  1$:     MOV     #377,GDATA      ;SETUP FOR CALL TO STREG
6172  027610  013737  002310  002306          MOV     GDATA,TDATA
6173
6174                                    ;  WE'LL USE 'STREG' TO LOAD & CHECK 'DDRB' WITH 377 THEREBY SETTING UP
6175                                    ;  'ORB' FOR BI-DIRECTIONAL TRANSFERS
6176
6177  027616  012700  120002                    MOV     #DDRB,R0                ;POINT TO ORB
6178  027622  004737  005034                    JSR     PC,STREG        ;LOAD & TEST IT
6179  027626  103003                    BCC     4$              ;IF OK, PROCEED WITH TESTING
6180  027630                            ERROR                   ;ELSE, REPORT THE ERROR
6181  027630  104460                                                                            TRAP    C$ERROR
6182  027632                            ESCAPE  TST             ;       & QUIT
6183  027632  104410                                                                            TRAP    C$ESCAPE
6184  027634  000216                                                                           .WORD   L10064-.
6185
6186                                    ;  NOW WE'LL USE 'STREG' TO SET & CHECK 'ORB'
6187
6188  027636  012700  120000  4$:     MOV     #ORB,R0         ;POINT TO DDRB
6189  027642  004737  005034          JSR     PC,STREG        ;LOAD & TEST 'ORB'
6190  027646  103003                    BCC     5$              ;IF NO ERROR HERE, PROCEED
6191  027650                            ERROR                   ;ELSE, REPORT THE ERROR
6192  027650  104460                                                                            TRAP    C$ERROR
6193  027652                            ESCAPE  TST             ;       & QUIT
6194  027652  104410                                                                            TRAP    C$ESCAPE
6195  027654  000176                                                                           .WORD   L10064-.
6196
6197  027656  004737  003762  5$:     JSR     PC,MSTCLR       ;ISSUE THE MASTER CLEAR (STAY IN M-LOOP)
6198  027662  103003                    BCC     10$             ;IF NO ERROR HERE, PROCEED
6199  027664                            ERROR                   ;ELSE, REPORT IT
```

```
6200  027664  104460                                                          TRAP    C$ERROR
6201  027666                          ESCAPE  TST             ;       & QUIT
6202  027666  104410                                                          TRAP    C$ESCAPE
6203  027670  000162                                                          .WORD   L10064-.
6204
6205  027672  005037  002310    10$:  CLR     GDATA           ;FOR TESTING PURPOSES LATER
6206
6207  027676  004537  004064        JSR     R5,READ         ;READ THE 'RESET' VALUE OF THE 'DDRB'
6208  027702  120002                DDRB
6209  027704  002312                BDATA
6210  027706  103003                BCC     12$             ;IF NO ERROR READING IT, PROCEED
6211  027710                        ERROR                   ;ELSE, REPORT IT
6212  027710  104460                                                          TRAP    C$ERROR
6213  027712                          ESCAPE  TST             ;       & QUIT
6214  027712  104410                                                          TRAP    C$ESCAPE
6215  027714  000136                                                          .WORD   L10064-.
6216
6217  027716  123737  002312  002310  12$:  CMPB    BDATA,GDATA     ;DID IT GET CLEARE?
6218  027724  001407                BEQ     14$             ;YES, GOOD.  NOW CHECK 'ORB'
6219  027726  012737  000002  002334        MOV     #DDRB&<17>,REGNUM       ;NO!    BUILD REGISTER # POINTER
6220  027734                        GEDF    EM5,ERR7        ;REPORT MASTER CLEAR FAILURE
6221                                                        ;       'DEVICE FATAL' ERROR # 42
6222  027734  104455                                                          TRAP    C$ERDF
6223  027736  000052                                                          .WORD   42
6224  027740  014515                                                          .WORD   EM5
6225  027742  006612                                                          .WORD   ERR7
6226
6227  027744  012737  000377  002310  14$:  MOV     #377,GDATA      ;SETUP FOR CALL TO STREG
6228  027752  013737  002310  002306        MOV     GDATA,TDATA
6229
6230                                ;  WE'LL USE 'STREG' TO LOAD & CHECK 'DDRB' WITH 377 THEREBY SETTING UP
6231                                ;  'ORB' FOR BY-DIRECTIONAL TRANSFERS
6232
6233  027760  012700  120002        MOV     #DDRB,R0                ;POINT TO ORB
6234  027764  004737  005034        JSR     PC,STREG        ;LOAD & TEST IT
6235  027770  103003                BCC     16$             ;IF OK, PROCEED WITH TESTING
6236  027772                        ERROR                   ;ELSE, REPORT THE ERROR
6237  027772  104460                                                          TRAP    C$ERROR
6238  027774                          ESCAPE  TST             ;       & QUIT
6239  027774  104410                                                          TRAP    C$ESCAPE
6240  027776  000054                                                          .WORD   L10064-.
6241
6242  030000  005037  002310  16$:  CLR     GDATA           ;SETUP FOR TESTING ORB
6243  030004  004537  004064        JSR     R5,READ         ;NOW READ THE 'RESET' VALUE OF 'ORB'
6244  030010  120000                ORB
6245  030012  002312                BDATA
6246  030014  103003                BCC     18$             ;IF NO ERROR READING IT, PROCEED
6247  030016                        ERROR                   ;ELSE, REPORT IT
6248  030016  104460                                                          TRAP    C$ERROR
6249  030020                          ESCAPE  TST             ;       & QUIT
6250  030020  104410                                                          TRAP    C$ESCAPE
6251  030022  000030                                                          .WORD   L10064-.
6252
6253  030024  123737  002310  002312  18$:  CMPB    GDATA,BDATA     ;WAS IT PROPERLY RESET?
6254  030032  001407                BEQ     32$             ;YES, THIS TEST IS DONE, EXIT
6255  030034  012737  000000  002334        MOV     #ORB&<17>,REGNUM        ;NO!    BUILD REGISTER # POINTER
```

```
C\DMAA.P11    12-DEC-80 15:59          TEST 20 -- VIA'S ORB/DDRB MASTER CLEAR TEST

  6256  030042                               GEDF    EM5,ERR7        ;REPORT MASTER CLEAR FAILURE
  6257                                                                 ;       'DEVICE FATAL'' ERROR # 43
  6258  030042  104455                                                                TRAP    C$ERDF
  6259  030044  000053                                                                .WORD   43
  6260  030046  014515                                                                .WORD   EM5
  6261  030050  006612                                                                .WORD   ERR7
  6262
  6263  030052                           32$:    ENDTST
  6264  030052                                                                L10064:
  6265  030052  104401                                                                TRAP    C$ETST
```

```
                                        .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
 030054                                                                                  T21::

 030054  004737  003762                         JSR     PC,MSTCLR       ;INIT DMV & START UP THE MAINT. LOOP
 030060  103003                                 BCC     1$              ;IF AN ERROR OCCURED,
 030062                                         ERROR                   ;REPORT IT &
 030062  104460                                                                          TRAP    C$ERROR
 030064                                         ESCAPE  TST             ;  EXIT
 030064  104410                                                                          TRAP    C$ESCAPE
 030066  000114                                                                          .WORD   L10065-.

 030070  012737  000377  002310  1$:            MOV     #377,GDATA      ;SETUP FOR CALL TO STREG
 030076  013737  002310  002306                 MOV     GDATA,TDATA
 030104  012700  120002                         MOV     #DDRB,R0

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

 030110  004737  005034                         JSR     PC,STREG        ;LOAD & TEST 'DDRB''
 030114  103003                                 BCC     5$              ;IF NO ERROR HERE, PROCEED
 030116                                         ERROR                   ;ELSE, REPORT IT
 030116  104460                                                                          TRAP    C$ERROR
 030120                                         ESCAPE  TST             ;       & QUIT
 030120  104410                                                                          TRAP    C$ESCAPE
 030122  000060                                                                          .WORD   L10065-.

 030124  004737  003762          5$:            JSR     PC,MSTCLR       ;ISSUE THE MASTER CLEAR (STAY IN M-LOOP)
 030130  103003                                 BCC     10$             ;IF NO ERROR HERE, PROCEED
 030132                                         ERROR                   ;ELSE, REPORT IT
 030132  104460                                                                          TRAP    C$ERROR
 030134                                         ESCAPE  TST             ;       & QUIT
 030134  104410                                                                          TRAP    C$ESCAPE
 030136  000044                                                                          .WORD   L10065-.

 030140  005037  002310          10$:           CLR     GDATA           ;FOR TESTING PURPOSES LATER
 030144  004537  004064                         JSR     R5,READ         ;NOW READ THE 'RESET'' VALUE OF 'DDRB''
 030150  120002                                 DDRB
 030152  002312                                 BDATA

 030154  123737  002310  002312                 CMPB    GDATA,BDATA     ;WAS IT PROPERLY RESET?
```

```
 6322  030162  001407                    BEQ     32$             ;YES, THIS TEST IS DONE, EXIT
 6323  030164  012737  000002  002334    MOV     #DDRBB<17>,REGNUM       ;NO!    BUILD REGISTER # POINTER
 6324  030172                            GEDF    EM5,ERR7        ;REPORT MASTER CLEAR FAILURE
 6325                                                            ;       'DEVICE FATAL'' ERROR # 44
 6326  030172  104455                                                                  TRAP    C$ERDF
 6327  030174  000054                                                                  .WORD   44
 6328  030176  014515                                                                  .WORD   EM5
 6329  030200  006612                                                                  .WORD   ERR7
 6330
 6331  030202                    32$:    ENDTST
 6332  030202                                                                  L10065:
 6333  030202  104401                                                                  TRAP    C$ETST
```

```
                                        .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
030204                                                                                          T22::

030204  004737  003762                          JSR     PC,MSTCLR       ;INIT DMV & START UP THE MAINT. LOOP
030210  103003                                  BCC     1$              ;IF AN ERROR OCCURED,
030212                                          ERROR                   ;REPORT IT &
030212  104460                                                                                  TRAP    C$ERROR
030214                                          ESCAPE  TST             ;  EXIT
030214  104410                                                                                  TRAP    C$ESCAPE
030216  000114                                                                                  .WORD   L10066-.

030220  012737  000377  002310  1$:     MOV     #377,GDATA      ;SETUP FOR CALL TO STREG
030226  013737  002310  002306          MOV     GDATA,TDATA
030234  012700  120003                  MOV     #DDRA,R0

                                        ;  NOW WE'LL USE ''STREG'' TO SET & CHECK 'DDRA''

030240  004737  005034                          JSR     PC,STREG        ;LOAD & TEST 'DDRA''
030244  103003                                  BCC     5$              ;IF NO ERROR HERE, PROCEED
030246                                          ERROR                   ;ELSE, REPORT IT
030246  104460                                                                                  TRAP    C$ERROR
030250                                          ESCAPE  TST             ;       & QUIT
030250  104410                                                                                  TRAP    C$ESCAPE
030252  000060                                                                                  .WORD   L10066-.

030254  004737  003762          5$:     JSR     PC,MSTCLR       ;ISSUE THE MASTER CLEAR (STAY IN M-LOOP)
030260  103003                                  BCC     10$             ;IF NO ERROR HERE, PROCEED
030262                                          ERROR                   ;ELSE, REPORT IT
030262  104460                                                                                  TRAP    C$ERROR
030264                                          ESCAPE  TST             ;       & QUIT
030264  104410                                                                                  TRAP    C$ESCAPE
030266  000044                                                                                  .WORD   L10066-.

030270  005037  002310          10$:    CLR     GDATA           ;FOR TESTING PURPOSES LATER
030274  004537  004064                  JSR     R5,READ         ;NOW READ THE 'RESET'' VALUE OF 'DDRA''
030300  120003                          DDRA
030302  002312                          BDATA

030304  123737  002310  002312          CMPB    GDATA,BDATA     ;WAS IT PROPERLY RESET?
030312  001407                          BEQ     32$             ;YES, THIS TEST IS DONE, EXIT
030314  012737  000003  002334          MOV     #DDRA&<17>,REGNUM       ;NO!    BUILD REGISTER # POINTER
030322                                  GEDF    EM5,ERR7        ;REPORT MASTER CLEAR FAILURE
```

```
6390                                                    ;       'DEVICE FATAL'' ERROR # 45
6391  030322  104455                                                          TRAP    C$ERDF
6392  030324  000055                                                          .WORD   45
6393  030326  014515                                                          .WORD   EM5
6394  030330  006612                                                          .WORD   ERR7
6395
6396  030332                  32$:    ENDTST
6397  030332                                                          L10066:
6398  030332  104401                                                          TRAP    C$ETST
```

```
                                .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
030334                                                                  T23::

030334  004737  003762                JSR     PC,MSTCLR       ;INIT DMV & START UP THE MAINT. LOOP
030340  103003                        BCC     1$              ;IF AN ERROR OCCURED,
030342                              1$: ERROR                   ;REPORT IT &
030342  104460                                                                  TRAP    C$ERROR
030344                              1$: ESCAPE  TST             ;  EXIT
030344  104410                                                                  TRAP    C$ESCAPE
030346  000120                                                                  .WORD   L10067-.

030350  004537  004322        1$:     JSR     R5,WRITEI       ;FORCE SR TO MODE 0
030354  120013                        ACR
030356  000000                        0
030360  012737  000123  002310        MOV     #123,GDATA      ;SETUP FOR CALL TO STREG
030366  013737  002310  002306        MOV     GDATA,TDATA
030374  012700  120012                MOV     #SR,R0

                                ;  NOW WE'LL USE 'STREG' TO SET & CHECK 'SR'

030400  004737  005034                JSR     PC,STREG        ;LOAD & TEST 'SR'
030404  103003                        BCC     5$              ;IF NO ERROR HERE, PROCEED
030406                              1$: ERROR                   ;ELSE, REPORT IT
030406  104460                                                                  TRAP    C$ERROR
030410                              1$: ESCAPE  TST             ;       & QUIT
030410  104410                                                                  TRAP    C$ESCAPE
030412  000054                                                                  .WORD   L10067-.

030414  004737  003762        5$:     JSR     PC,MSTCLR       ;ISSUE THE MASTER CLEAR (STAY IN M-LOOP)
030420  103003                        BCC     10$             ;IF NO ERROR HERE, PROCEED
030422                              1$: ERROR                   ;ELSE, REPORT IT
030422  104460                                                                  TRAP    C$ERROR
030424                              1$: ESCAPE  TST             ;       & QUIT
030424  104410                                                                  TRAP    C$ESCAPE
030426  000040                                                                  .WORD   L10067-.

030430  004537  004064        10$:    JSR     R5,READ         ;NOW READ THE 'RESET' VALUE OF 'SR'
030434  120012                        SR                      ;       (IT SHOULDN'T HAVE CHANGED)
030436  002312                        BDATA

030440  123737  002310  002312        CMPB    GDATA,BDATA     ;WAS IT PROPERLY RESET?
030446  001407                        BEQ     32$             ;YES, THIS TEST IS DONE, EXIT
```

```
6455  030450  012737  000012  002334          MOV     #SR&<17>,REGNUM ;NO!    BUILD REGISTER # POINTER
6456  030456                                  GEDF    EM5,ERR7        ;REPORT MASTER CLEAR FAILURE
6457                                                                  ;       'DEVICE FATAL'' ERROR # 46
6458  030456  104455                                                                  TRAP    C$ERDF
6459  030460  000056                                                                  .WORD   46
6460  030462  014515                                                                  .WORD   EM5
6461  030464  006612                                                                  .WORD   ERR7
6462
6463  030466                          32$:    ENDTST
6464  030466                                                                  L10067:
6465  030466  104401                                                                  TRAP    C$ETST
```

```
                        .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
                                                                                        T24::

030470  004737  003762          JSR     PC,MSTCLR       ;INIT DMV & START UP THE MAINT. LOOP
030474  103003                  BCC     1$              ;IF AN ERROR OCCURED,
030476                          ERROR                   ;REPORT IT &
030476  104460                                                                  TRAP    C$ERROR
030500                          ESCAPE  TST             ;  EXIT
030500  104410                                                                  TRAP    C$ESCAPE
030502  000114                                                                  .WORD   L10070-.

030504  012737  000252  002310  1$:     MOV     #252,GDATA      ;SETUP FOR CALL TO STREG
030512  013737  002310  002306          MOV     GDATA,TDATA
030520  012700  120013                  MOV     #ACR,R0

                        ;  NOW WE'LL USE 'STREG' TO SET & CHECK 'ACR'

030524  004737  005034          JSR     PC,STREG        ;LOAD & TEST 'ACR'
030530  103003                  BCC     5$              ;IF NO ERROR HERE, PROCEED
030532                          ERROR                   ;ELSE, REPORT IT
030532  104460                                                                  TRAP    C$ERROR
030534                          ESCAPE  TST             ;       & QUIT
030534  104410                                                                  TRAP    C$ESCAPE
030536  000060                                                                  .WORD   L10070-.

030540  004737  003762  5$:     JSR     PC,MSTCLR       ;ISSUE THE MASTER CLEAR (STAY IN M-LOOP)
030544  103003                  BCC     10$             ;IF NO ERROR HERE, PROCEED
030546                          ERROR                   ;ELSE, REPORT IT
030546  104460                                                                  TRAP    C$ERROR
030550                          ESCAPE  TST             ;       & QUIT
030550  104410                                                                  TRAP    C$ESCAPE
030552  000044                                                                  .WORD   L10070-.

030554  005037  002310  10$:    CLR     GDATA           ;FOR TESTING PURPOSES LATER
030560  004537  004064          JSR     R5,READ         ;NOW READ THE 'RESET' VALUE OF 'ACR'
030564  120013                  ACR
030566  002312                  BDATA

030570  123.37  002310  002312          CMPB    GDATA,BDATA     ;WAS IT PROPERLY RESET?
030576  001407                  BEQ     32$             ;YES, THIS TEST IS DONE, EXIT
030600  012737  000013  002334          MOV     #ACR&<17>,REGNUM        ;NO!    BUILD REGISTER # POINTER
030606                          GEDF    EM5,ERR7        ;REPORT MASTER CLEAR FAILURE
```

```
                                                ;       'DEVICE FATAL'' ERROR # 47
6522
6523  030606  104455                                                  TRAP    C$ERDF
6524  030610  000057                                                  .WORD   47
6525  030612  014515                                                  .WORD   EM5
6526  030614  006612                                                  .WORD   ERR7
6527
6528  030616                        32$:    ENDTST
6529  030616                                                      L10070:
6530  030616  104401                                                  TRAP    C$ETST
```

```
                                       .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
 030620                                                                                  T5::

 030620  004737  003762                         JSR     PC,MSTCLR       ;INIT DMV & START UP THE MAINT. LOOP
 030624  103003                                 BCC     1$              ;IF AN ERROR OCCURED,
 030626                                         ERROR                   ;REPORT IT &
 030626  104460                                                                                  TRAP    C$ERROR
 030630                                         ESCAPE  TST             ;  EXIT
 030630  104410                                                                                  TRAP    C$ESCAPE
 030632  000114                                                                                  .WORD   L10071-.

 030634  012737  000377  002310  1$:            MOV     #377,GDATA      ;SETUP FOR CALL TO STREG
 030642  013737  002310  002306                 MOV     GDATA,TDATA
 030650  012700  120014                         MOV     #PCR,R0

                                       ;  NOW WE'LL USE ''STREG'' TO SET & CHECK 'PCR''

 030654  004737  005034                         JSR     PC,STREG        ;LOAD & TEST 'PCR''
 030660  103003                                 BCC     5$              ;IF NO ERROR HERE. PROCEED
 030662                                         ERROR                   ;ELSE, REPORT IT
 030662  104460                                                                                  TRAP    C$ERROR
 030664                                         ESCAPE  TST             ;       & QUIT
 030664  104410                                                                                  TRAP    C$ESCAPE
 030666  000060                                                                                  .WORD   L10071-.

 030670  004737  003762          5$:            JSR     PC,MSTCLR       ;ISSUE THE MASTER CLEAR (STAY IN M-LOOP)
 030674  103003                                 BCC     10$             ;IF NO ERROR HERE, PROCEED
 030676                                         ERROR                   ;ELSE, REPORT IT
 030676  104460                                                                                  TRAP    C$ERROR
 030700                                         ESCAPE  TST             ;       & QUIT
 030700  104410                                                                                  TRAP    C$ESCAPE
 030702  000044                                                                                  .WORD   L10071-.

 030704  005037  002310          10$:           CLR     GDATA           ;FOR TESTING PURPOSES LATER
 030710  004537  004064                         JSR     R5,READ         ;NOW READ THE ''RESET'' VALUE OF 'PCR''
 030714  120014                                 PCR
 030716  002312                                 BDATA

 030720  123737  002310  002312                 CMPB    GDATA,BDATA     ;WAS IT PROPERLY RESET?
 030726  001407                                 BEQ     32$             ;YES, THIS TEST IS DONE, EXIT
 030730  012737  000014  002334                 MOV     #PCR&<17>,REGNUM        ;NO!    BUILD REGISTER # POINTER
 030736                                         GEDF    EM5,ERR7        ;REPORT MASTER CLEAR FAILURE
```

```
6587
6588  030736  104455                    ;       'DEVICE FATAL'' ERROR # 48
6589  030740  000060                                TRAP    C$ERDF
6590  030742  014515                                .WORD   48
6591  030744  006612                                .WORD   EM5
6592                                                .WORD   ERR7
6593  030746                    32$:    ENDTST
6594  030746                                    L10071:
6595  030746  104401                                TRAP    C$ETST
```

```
6596                                    .SBTTL TEST 26 -- VIA'S IER MASTER CLEAR TEST
6597
6598                                    ;++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
6599                                    ;*
6600                                    ;*      TEST 26 -- VIA'S IER MASTER CLEAR TEST
6601                                    ;*
6602                                    ;*      IER == ''INTERRUPT ENABLE REGISTER''
6603                                    ;*
6604                                    ;* A 377 BYTE IS WRITTEN INTO IER AND THE REGISTER IS READ BACK AND CHECKED
6605                                    ;* FOR 377. THEN, A MASTER CLEAR IS PERFORMED AND IER IS READ AND CHECKED FOR
6606                                    ;* 200.
6607                                    ;*
6608                                    ;--++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
6609                                    ;
6610                                    ;       BGNTST
6611  030750                                                                          T26::
6612
6613  030750  004737  003762                   JSR     PC,MSTCLR       ;INIT DMV & START UP THE MAINT. LOOP
6614  030754  103003                   BCC     1$              ;IF AN ERROR OCCURED,
6615  030756                           ERROR                   ;REPORT IT &
6616  030756  104460                                                           TRAP    C$ERROR
6617  030760                           ESCAPE  TST             ;  EXIT
6618  030760  104410                                                           TRAP    C$ESCAPE
6619  030762  000122                                                           .WORD   L10072-.
6620
6621  030764  105077  151362           1$:     CLRB    @#BSEL0         ;MAKE SURE NO Q-BUS INTERRUPTS RESULT FROM
6622                                                                   ;       TESTING THE IER REGISTER
6623  030770  012737  000377  002310           MOV     #377,GDATA      ;SETUP FOR CALL TO STREG
6624  030776  013737  002310  002306           MOV     GDATA,TDATA
6625  031004  012700  120016                   MOV     #IENR,R0
6626
6627                                    ;  NOW WE'LL USE 'STREG' TO SET & CHECK ''IER''
6628
6629  031010  004737  005034                   JSR     PC,STREG        ;LOAD & TEST ''IER''
6630  031014  103003                   BCC     5$              ;IF NO ERROR HERE, PROCEED
6631  031016                           ERROR                   ;ELSE, REPORT IT
6632  031016  104460                                                           TRAP    C$ERROR
6633  031020                           ESCAPE  TST             ;       & QUIT
6634  031020  104410                                                           TRAP    C$ESCAPE
6635  031022  000062                                                           .WORD   L10072-.
6636
6637  031024  004737  003762           5$:     JSR     PC,MSTCLR       ;ISSUE THE MASTER CLEAR (STAY IN M-LOOP)
6638  031030  103003                   BCC     10$             ;IF NO ERROR HERE, PROCEED
6639  031032                           ERROR                   ;ELSE, REPORT IT
6640  031032  104460                                                           TRAP    C$ERROR
6641  031034                           ESCAPE  TST             ;       & QUIT
6642  031034  104410                                                           TRAP    C$ESCAPE
6643  031036  000046                                                           .WORD   L10072-.
6644
6645  031040  012737  000200  002310   10$:    MOV     #200,GDATA      ;FOR TESTING PURPOSES LATER
6646  031046  004537  004064                   JSR     R5,READ         ;NOW READ THE 'RESET'' VALUE OF ''IER''
6647  031052  120016                   IENR
6648  031054  002312                   BDATA
6649
6650  031056  123737  002310  002312           CMPB    GDATA,BDATA     ;WAS IT PROPERLY RESET?
6651  031064  001407                   BEQ     32$             ;YES, THIS TEST IS DONE, EXIT
```

```
6652  031066  012737  000016  002334          MOV     #IENRB<17>,REGNUM       ;NOW    BUILD REGISTER # POINTER
6653  031074                                  GEDF    EM5,ERR7                ;REPORT MASTER CLEAR FAILURE
6654                                                                          ;       'DEVICE FATAL'' ERROR # 49
6655  031074  104455                                                                  TRAP    C$ERDF
6656  031076  000061                                                                  .WORD   49
6657  031100  014515                                                                  .WORD   EM5
6658  031102  006612                                                                  .WORD   ERR7
6659
6660  031104                          32$:    ENDTST
6661  031104                                                                  L10072:
6662  031104  104401                                                                  TRAP    C$ETST
6663
```

```
                        .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
031106                                                          T27::
                                BGNSUB
031106                                                          T27.1:
031106                                                          
031106  104402                                                      TRAP    C$BSUB
```

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

                        ;-------------------------------------------------------------------------

031110  004737  003762          JSR     PC,MSTCLR       ;INIT DMV & ENTER M-LOOP
031114  103003                  BCC     1$              ;IF NO ERROR, PROCEED WITH TESTING
031116                          ERROR                   ;ELSE, REPORT ERROR
031116  104460                                                          TRAP    C$ERROR
031120                          ESCAPE  TST             ;   & EXIT TEST
031120  104410                                                          TRAP    C$ESCAPE
031122  004734                                                          .WORD   L10073-.
031124  004537  004660  1$:     JSR     R5,INITT1       ;INITIALIZE TIMER # 1
031130  000000                  0                       ;       0 ==> LATCHES
031132  000000                  0                       ;       MODE 0 & "T1" INT. ENABLE FLAG CLEARED
031134  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
031136                          ERROR                   ;ELSE, REPORT IT
031136  104460                                                          TRAP    C$ERROR
031140                          ESCAPE  TST             ;       AND EXIT THIS TEST
031140  104410                                                          TRAP    C$ESCAPE
031142  004714                                                          .WORD   L10073-.
031144  004737  036112          JSR     PC,GETT1        ;IS "T1" SET?
031150  102002                  BVC     .+6             ;IF NO ERROR, PROCEED
031152                          ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
031152  104410                                                          TRAP    C$ESCAPE
031154  002202                                                          .WORD   L10074-.
031156  103143                  BCC     6$              ;NO, GOOD.
031160  004537  004064          JSR     R5,READ         ;GET T1CL FOR ERROR MESSAGE
031164  120004                  T1CL
031166  002450                  TMP4
031170  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
031172                          ERROR                   ;ELSE, REPORT IT
031172  104460                                                          TRAP    C$ERROR
031174                          ESCAPE  TST             ;       AND EXIT THIS TEST
031174  104410                                                          TRAP    C$ESCAPE
031176  004660                                                          .WORD   L10073-.
031200  004537  004064          JSR     R5,READ         ;GET T1CH FOR ERROR MESSAGE
031204  120005                  T1CH
031206  002452                  TMP5
031210  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
031212                          ERROR                   ;ELSE, REPORT IT
031212  104460                                                          TRAP    C$ERROR
031214                          ESCAPE  TST             ;       AND EXIT THIS TEST
031214  104410                                                          TRAP    C$ESCAPE
031216  004640                                                          .WORD   L10073-.
031220  004537  004064          JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
031224  120006                  T1LL
031226  002454                  TMP6
031230  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
031232                          ERROR                   ;ELSE, REPORT IT
031232  104460                                                          TRAP    C$ERROR
031234                          ESCAPE  TST             ;       AND EXIT THIS TEST
031234  104410                                                          TRAP    C$ESCAPE
031236  004620                                                          .WORD   L10073-.
031240  004537  004064          JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
031244  120007                  T1LH
031246  002456                  TMP7
031250  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
031252                          ERROR                   ;ELSE, REPORT IT
```

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

                                                                        TRAP    C$ERROR
                ESCAPE  TST             ;       AND EXIT THIS TEST
                                                                        TRAP    C$ESCAPE
                                                                        .WORD   L10073-.
 6776  031252  104460
 6777  031254
 6778  031254  104410
 6779  031256  004600
 6780  031260  004537  004064      JSR     R5,READ         ;GET ACR FOR ERROR MESSAGE
 6781  031264  120013              ACR
 6782  031266  002466              TMP8
 6783  031270  103003              BCC     .+10            ;IF NO ERROR, PROCEED
 6784  031272                      ERROR                   ;ELSE, REPORT IT
                                                                        TRAP    C$ERROR
 6785  031272  104460
                ESCAPE  TST             ;       AND EXIT THIS TEST
 6786  031274                                                             TRAP    C$ESCAPE
 6787  031274  104410                                                     .WORD   L10073-.
 6788  031276  004560
 6789  031300              GEDF    EM50A,ERR50     ;YES, REPORT IT'S NOT BEING CLEARED @ INIT.
 6790                                              ;       'DEVICE FATAL'' ERROR # 50
 6791  031300  104455                                                     TRAP    C$ERDF
 6792  031302  000062                                                     .WORD   50
 6793  031304  016067                                                     .WORD   EM50A
 6794  031306  010762                                                     .WORD   ERR50
 6795  031310
                PRINTX  #FMT50M         ;  & SAY THE COUNTERS HAVEN'T BEEN LOADED YET!
 6796  031310  012746  013174                                             MOV     #FMT50M,-(SP)
 6797  031314  012746  000001                                             MOV     #1,-(SP)
 6798  031320  010600                                                     MOV     SP,R0
 6799  031322  104415                                                     TRAP    C$PNTX
 6800  031324  062706  000004                                             ADD     #4,SP
 6801
 6802                   ;-----------------------------------------------------------------------
 6803
 6804  031330  112737  000002  002453      MOVB    #2,TMP5+1
 6805  031336  004537  004310              JSR     R5,WRITE        ;INIT TIMER # 1 BY WRITING INTO
 6806  031342  120005                      T1CH                    ;T1C-H (ADDR 05)
 6807  031344  002453                      TMP5+1
 6808  031346  103003                      BCC     .+10            ;IF NO ERROR, PROCEED
 6809  031350                              ERROR                   ;ELSE, REPORT IT
                                                                        TRAP    C$ERROR
 6810  031350  104460
 6811  031352                      ESCAPE  TST             ;       AND EXIT THIS TEST
 6812  031352  104410                                                     TRAP    C$ESCAPE
 6813  031354  004502                                                     .WORD   L10073-.
 6814  031356  004737  036112              JSR     PC,GETT1        ;IS 'T1'' SET?
 6815  031362  102002                      BVC     .+6             ;IF NO ERROR, PROCEED
 6816  031364                              ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
                                                                        TRAP    C$ESCAPE
 6817  031364  104410
 6818  031366  001770                                                     .WORD   L10074-.
 6819  031370  103036              BCC     6$              ;NO, GOOD.
 6820  031372  004537  004064      JSR     R5,READ         ;GET T1CL FOR ERROR MESSAGE
 6821  031376  120004              T1CL
 6822  031400  002450              TMP4
 6823  031402  103003              BCC     .+10            ;IF NO ERROR, PROCEED
 6824  031404                      ERROR                   ;ELSE, REPORT IT
                                                                        TRAP    C$ERROR
 6825  031404  104460
 6826  031406                      ESCAPE  TST             ;       AND EXIT THIS TEST
 6827  031406  104410                                                     TRAP    C$ESCAPE
 6828  031410  004446                                                     .WORD   L10073-.
 6829  031412  004537  004064      JSR     R5,READ         ;GET T1CH FOR ERROR MESSAGE
 6830  031416  120005              T1CH
 6831  031420  002452              TMP5
```

```
6832  031422  103003                  BCC     .+10            ;IF NO EPROR, PROCEED
6833  031424                          ERROR                   ;ELSE, REPORT IT
6834  031424  104460                                                          TRAP    C$ERROR
6835  031426                          ESCAPE  TST             ;       AND EXIT THIS TEST
6836  031426  104410                                                          TRAP    C$ESCAPE
6837  031430  004426                                                          .WORD   L10073-.
6838  031432  004537  004064          JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
6839  031436  120007                  T1LH
6840  031440  002456                  TMP7
6841  031442  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
6842  031444                          ERROR                   ;ELSE, REPORT IT
6843  031444  104460                                                          TRAP    C$ERROR
6844  031446                          ESCAPE  TST             ;       AND EXIT THIS TEST
6845  031446  104410                                                          TRAP    C$ESCAPE
6846  031450  004406                                                          .WORD   L10073-.
6847  031452                          GEDF    EM50B,ERR50     ;YES, REPORT IT'S NOT BEING CLEARED @ INIT.
6848                                  ;       'DEVICE FATAL'' ERROR # 51
6849  031452  104455                                                          TRAP    C$ERDF
6850  031454  000063                                                          .WORD   51
6851  031456  016135                                                          .WORD   EM50B
6852  031460  010762                                                          .WORD   ERR50
6853  031462                          ESCAPE  SUB             ;AND EXIT SUBTEST
6854  031462  104410                                                          TRAP    C$ESCAPE
6855  031464  001672                                                          .WORD   L10074-.
6856
6857                                  ;---------- ----------
6858
6859  031466  004537  004064  6$:     JSR     R5,READ         ;GET ACR FOR LATER ERROR MESSAGES
6860  031472  120013                  ACR
6861  031474  002466                  TMPB
6862  031476  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
6863  031500                          ERROR                   ;ELSE, REPORT IT
6864  031500  104460                                                          TRAP    C$ERROR
6865  031502                          ESCAPE  TST             ;       AND EXIT THIS TEST
6866  031502  104410                                                          TRAP    C$ESCAPE
6867  031504  004352                                                          .WORD   L10073-.
6868  031506  112737  000377  002445  MOVB    #377,TMP2+1     ;INITIALIZE ORB FOR INPUT/OUTPUT
6869  031514  004537  004310          JSR     R5,WRITE
6870  031520  120002                  DDRB
6871  031522  002445                  TMP2+1
6872  031524  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
6873  031526                          ERROR                   ;ELSE, REPORT IT
6874  031526  104460                                                          TRAP    C$ERROR
6875  031530                          ESCAPE  TST             ;       AND EXIT THIS TEST
6876  031530  104410                                                          TRAP    C$ESCAPE
6877  031532  004324                                                          .WORD   L10073-.
6878  031534  112737  000377  002441  MOVB    #377,TMP0+1     ;SETUP VALUE FOR ORB
6879  031542  004537  004310          JSR     R5,WRITE        ;DO IT
6880  031546  120000                  ORB
6881  031550  002441                  TMP0+1
6882  031552  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
6883  031554                          ERROR                   ;ELSE, REPORT IT
6884  031554  104460                                                          TRAP    C$ERROR
6885  031556                          ESCAPE  TST             ;       AND EXIT THIS TEST
6886  031556  104410                                                          TRAP    C$ESCAPE
6887  031560  004276                                                          .WORD   L10073-.
```

```
CVDMAA.P11    12-DEC-80 15:59        TEST 27 -- VIA TIMER # 1 ONE-SHOT MODE

 6888  031562  004537  036060              JSR     R5,LOCT1C       ;LOAD TIMER # 1
 6889  031566     252              7$:     .BYTE   252
 6890  031567     252              8$:     .BYTE   252
 6891
 6892                                      ;-----------------------------------------------------------------------
 6893
 6894  031570  004737  036276              JSR     PC,GETPB7       ;GET 'PB7'.  IS IT SET?
 6895  031574  102002                      BVC     .+6             ;IF NO ERROR, PROCEED
 6896  031576                              ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
                                                                                        TRAP    C$ESCAPE
 6897  031576  104410                                                                  .WORD   L10074-.
 6898  031600  001556
 6899  031602  103404                      BCS     9$              ;IT IS.  (SET BY LOADING DDRB & ORB ABOVE)
 6900  031604                              GEDF    EM50W,ERR1      ;IF NOT, TIMER 1 CLEARED IT!!!
 6901                                                              ;       'DEVICE FATAL'' ERROR # 52
 6902  031604  104455                                                                  TRAP    C$ERDF
 6903  031606  000064                                                                  .WORD   52
 6904  031610  017305                                                                  .WORD   EM50W
 6905  031612  005276                                                                  .WORD   ERR1
 6906  031614  004737  036150      9$:     JSR     PC,KICKT1       ;IT TAKES SO MUCH TIME TO CHECK FOR (& MAYBE
 6907                                                              ;  EVEN REPORT) THIS ERROR THAT WE SHOULD
 6908                                                              ;  KICK OFF THE TIMER AGAIN
 6909  031620  103003                      BCC     .+10            ;IF NO ERROR, PROCEED
 6910  031622                              ERROR                   ;ELSE, REPORT IT
 6911  031622  104460                                                                  TRAP    C$ERROR
 6912  031624                              ESCAPE  TST             ;       AND EXIT THIS TEST
 6913  031624  104410                                                                  TRAP    C$ESCAPE
 6914  031626  004230                                                                  .WORD   L10073-.
 6915  031630  000240                      NOP                     ;
 6916  031632  000240                      NOP                     ;NOW WAIT A LITTLE WHILE -- LET T1CL CHANGE
 6917  031634  000240                      NOP                     ;
 6918  031636  004537  004064              JSR     R5,READ         ;READ THE LOW COUNTER
 6919  031642  120004                      T1CL
 6920  031644  002450                      TMP4
 6921  031646  103003                      BCC     .+10            ;IF NO ERROR, PROCEED
 6922  031650                              ERROR                   ;ELSE, REPORT IT
 6923  031650  104460                                                                  TRAP    C$ERROR
 6924  031652                              ESCAPE  TST             ;       AND EXIT THIS TEST
 6925  031652  104410                                                                  TRAP    C$ESCAPE
 6926  031654  004202                                                                  .WORD   L10073-.
 6927  031656  123737  002450  031566      CMPB    TMP4,7$         ;MAKE SURE THE COUNTER IS DECREMENTING
 6928  031664  001024                      BNE     12$             ;IT IS, NOW SEE IF THE HIGH COUNTER IS TOO
 6929  031666  004537  004064              JSR     R5,READ         ;GET T1CH FOR ERROR MESSAGE
 6930  031672  120005                      T1CH
 6931  031674  002452                      TMP5
 6932  031676  103003                      BCC     .+10            ;IF NO ERROR, PROCEED
 6933  031700                              ERROR                   ;ELSE, REPORT IT
 6934  031700  104460                                                                  TRAP    C$ERROR
 6935  031702                              ESCAPE  TST             ;       AND EXIT THIS TEST
 6936  031702  104410                                                                  TRAP    C$ESCAPE
 6937  031704  004152                                                                  .WORD   L10073-.
 6938  031706  004537  004064              JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
 6939  031712  120006                      T1LL
 6940  031714  002454                      TMP6
 6941  031716  103003                      BCC     .+10            ;IF NO ERROR, PROCEED
 6942  031720                              ERROR                   ;ELSE, REPORT IT
 6943  031720  104460                                                                  TRAP    C$ERROR
```

```
6944  031722
6945  031722  104410                          ESCAPE  TST             ;       AND EXIT THIS TEST
                                                                              TRAP    C$ESCAPE
6946  031724  004132                                                        .WORD   L10073-.
6947  031726                                  GEDF    EM50D,ERR50     ;IT WASN'T -- REPORT THE ERROR
6948                                                                  ;       'DEVICE FATAL'' ERROR # 53
6949  031726  104455                                                        TRAP    C$ERDF
6950  031730  000065                                                        .WORD   53
6951  031732  016251                                                        .WORD   EM50D
6952  031734  010762                                                        .WORD   ERR50
6953  031736  012703  000100      12$:    MOV     #100,R3         ;INIT. TIMEOUT VALUE
6954  031742  004537  004064      13$:    JSR     R5,READ         ;READ THE HIGH COUNTER
6955  031746  120005                      T1CH
6956  031750  002452                      TMP5
6957  031752  103003                      BCC     .+10            ;IF NO ERROR, PROCEED
6958  031754                              ERROR                   ;ELSE, REPORT IT
6959  031754  104460                                                        TRAP    C$ERROR
6960  031756                          ESCAPE  TST             ;       AND EXIT THIS TEST
6961  031756  104410                                                        TRAP    C$ESCAPE
6962  031760  004076                                                        .WORD   L10073-.
6963  031762  123737  002452  031567        CMPB    TMP5,8$         ;DID IT CHANGE FROM THE LOADED VALUE?
6964  031770  001037                      BNE     17$             ;YES, PROCEED WITH TESTING
6965  031772  077315                      SOB     R3,13$          ;NO,  IF NO TIMEOUT, TRY AGAIN
6966  031774  004537  004064              JSR     R5,READ         ;GET IFR FOR ERROR MESSAGE
6967  032000  120015                      IFR
6968  032002  002472                      TMPD
6969  032004  103003                      BCC     .+10            ;IF NO ERROR, PROCEED
6970  032006                              ERROR                   ;ELSE, REPORT IT
6971  032006  104460                                                        TRAP    C$ERROR
6972  032010                          ESCAPE  TST             ;       AND EXIT THIS TEST
6973  032010  104410                                                        TRAP    C$ESCAPE
6974  032012  004044                                                        .WORD   L10073-.
6975  032014  004537  004064          JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
6976  032020  120006                  T1LL
6977  032022  002454                  TMP6
6978  032024  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
6979  032026                          ERROR                   ;ELSE, REPORT IT
6980  032026  104460                                                        TRAP    C$ERROR
6981  032030                          ESCAPE  TST             ;       AND EXIT THIS TEST
6982  032030  104410                                                        TRAP    C$ESCAPE
6983  032032  004024                                                        .WORD   L10073-.
6984  032034  004537  004064          JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
6985  032040  120007                  T1LH
6986  032042  002456                  TMP7
6987  032044  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
6988  032046                          ERROR                   ;ELSE, REPORT IT
6989  032046  104460                                                        TRAP    C$ERROR
6990  032050                          ESCAPE  TST             ;       AND EXIT THIS TEST
6991  032050  104410                                                        TRAP    C$ESCAPE
6992  032052  004004                                                        .WORD   L10073-.
6993  032054                          GEDF    EM50E,ERR50     ;ELSE, REPORT THAT HIGH COUNTER ISN'T RUNNING
6994                                                          ;       'DEVICE FATAL'' ERROR # 54
6995  032054  104455                                                        TRAP    C$ERDF
6996  032056  000066                                                        .WORD   54
6997  032060  016305                                                        .WORD   EM50E
6998  032062  010762                                                        .WORD   ERR50
6999  032064                          ESCAPE  SUB             ;IN THAT CASE, WE CAN'T PROCEED WITH TESTING EITHER
```

```
7000  032064  104410                                                          TRAP    C$ESCAPE
7001  032066  001270                                                          .WORD   L10074-.
7002                          ;-------------------------------------------------------------------------
7003
7004  032070  112737  000377  002445  17$:    MOVB    #377,TMP2+1     ;INITIALIZE ORB FOR INPUT/OUTPUT
7005  032076  004537  004310                  JSR     R5,WRITE
7006  032102  120002                          DDRB
7007  032104  002445                          TMP2+1
7008  032106  103003                          BCC     .+10            ;IF NO ERROR, PROCEED
7009  032110                                  ERROR                   ;ELSE, REPORT IT
7010  032110  104460                                                          TRAP    C$ERROR
7011  032112                                  ESCAPE  TST             ;       AND EXIT THIS TEST
7012  032112  104410                                                          TRAP    C$ESCAPE
7013  032114  003742                                                          .WORD   L10073-.
7014  032116  023737  002440  002441          CMP     TMP0,TMP0+1     ;CLEAR PB7 BY WRITING INTO ORB
7015  032124  004537  004322                  JSR     R5,WRITEI
7016  032130  120000                          ORB
7017  032132  000030                          30                      ;  (THIS CLEARS DTR & RTS! ALSO)
7018  032134  103003                          BCC     .+10            ;IF NO ERROR, PROCEED
7019  032136                                  ERROR                   ;ELSE, REPORT IT
7020  032136  104460                                                          TRAP    C$ERROR
7021  032140                                  ESCAPE  TST             ;       AND EXIT THIS TEST
7022  032140  104410                                                          TRAP    C$ESCAPE
7023  032142  003714                                                          .WORD   L10073-.
7024  032144  004537  036060                  JSR     R5,LODT1C       ;RE-LOAD TIMER # 1 WITH A VALUE WHICH CAUSE AN
7025  032150     001          18$:    .BYTE   1                       ;ALMOST IMMEDIATE TIMEOUT
7026  032151     000          19$:    .BYTE   0                       ; (ADDRESS OF HIGH BYTE FOR T1C-H (ADDR 05))
7027                          ;-------------------------------------------------------------------------
7028
7029  032152  004737  036112          JSR     PC,GETT1        ;WAS 'T1' SET BY THE ABOVE OPERATION?
7030  032156  102002                  BVC     .+6             ;IF NO ERROR, PROCEED
7031  032160                          ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
7032  032160  104410                                                  TRAP    C$ESCAPE
7033  032162  001174                                                  .WORD   L10074-.
7034  032164  103426                  BCS     20$             ;YES, OK -- CONTINUE ERROR CHECKING
7035  032166  004537  004064          JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
7036  032172  120006                  T1LL
7037  032174  002454                  TMP6
7038  032176  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
7039  032200                          ERROR                   ;ELSE, REPORT IT
7040  032200  104460                                                  TRAP    C$ERROR
7041  032202                          ESCAPE  TST             ;       AND EXIT THIS TEST
7042  032202  104410                                                  TRAP    C$ESCAPE
7043  032204  003652                                                  .WORD   L10073-.
7044  032206  004537  004064          JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
7045  032212  120007                  T1LH
7046  032214  002456                  TMP7
7047  032216  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
7048  032220                          ERROR                   ;ELSE, REPORT IT
7049  032220  104460                                                  TRAP    C$ERROR
7050  032222                          ESCAPE  TST             ;       AND EXIT THIS TEST
7051  032222  104410                                                  TRAP    C$ESCAPE
7052  032224  003632                                                  .WORD   L10073-.
7053  032226                          GEDF    EM50F,ERR50     ;NO   BAD NEWS!  REPORT THE FAILURE
7054                                                          ;       'DEVICE FATAL'' ERROR # 55
7055  032226  104455                                                  TRAP    C$ERDF
```

```
7056  032230  000067                                                          .WORD   55
7057  032232  016341                                                          .WORD   EM50F
7058  032234  010762                                                          .WORD   ERR50
7059  032236                          ESCAPE  SUB             ;  AND GET OUT OF SUBTEST
7060  032236  104410                                                          TRAP    C$ESCAPE
7061  032240  001116                                                          .WORD   L10074-.
7062  032242  004737  036276    20$:  JSR     PC,GETPB7       ;GET 'PB7'.  IS IT CLEARED?
7063  032246  102002                  BVC     .+6             ;IF NO ERROR, PROCEED
7064  032250                          ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
7065  032250  104410                                                          TRAP    C$ESCAPE
7066  032252  001104                                                          .WORD   L10074-.
7067  032254  103024                  BCC     40$             ;IF CLEARED, DDRB IS STILL IN CONTROL OF IT
7068  032256  004537  004064          JSR     R5.READ         ;GET T1LL FOR ERROR MESSAGE
7069  032262  120006                  T1LL
7070  032264  002454                  TMP6
7071  032266  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
7072  032270                          ERROR                   ;ELSE, REPORT IT
7073  032270  104460                                                          TRAP    C$ERROR
7074  032272                          ESCAPE  TST             ;       AND EXIT THIS TEST
7075  032272  104410                                                          TRAP    C$ESCAPE
7076  032274  003562                                                          .WORD   L10073-.
7077  032276  004537  004064          JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
7078  032302  120007                  T1LH
7079  032304  002456                  TMP7
7080  032306  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
7081  032310                          ERROR                   ;ELSE, REPORT IT
7082  032310  104460                                                          TRAP    C$ERROR
7083  032312                          ESCAPE  TST             ;       AND EXIT THIS TEST
7084  032312  104410                                                          TRAP    C$ESCAPE
7085  032314  003542                                                          .WORD   L10073-.
7086  032316                          GEDF    EM50W,ERR50     ;ELSE, IT'S BEING SET BY TIMER 1 IN MODE 0!
7087                                                          ;       'DEVICE FATAL'' ERROR # 56
7088  032316  104455                                                          TRAP    C$ERDF
7089  032320  000070                                                          .WORD   56
7090  032322  017305                                                          .WORD   EM50W
7091  032324  010762                                                          .WORD   ERR50
7092  032326  004537  004064    40$:  JSR     R5,READ         ;READ T1C-H (ADDR 05) TO SEE IF THIS CLEARS 'T1''
7093  032332  120005                  T1CH                    ;(THIS VALUE ISN'T CHECKED BECAUSE IT CAN BE
7094  032334  002452                  TMP5                    ; ALMOST ANYTHING)
7095  032336  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
7096  032340                          ERROR                   ;ELSE, REPORT IT
7097  032340  104460                                                          TRAP    C$ERROR
7098  032342                          ESCAPE  TST             ;       AND EXIT THIS TEST
7099  032342  104410                                                          TRAP    C$ESCAPE
7100  032344  003512                                                          .WORD   L10073-.
7101  032346  004737  036112          JSR     PC,GETT1        ;PUT THE CURRENT 'T1'' VALUE INTO THE CARRY BIT
7102  032352  102002                  BVC     .+6             ;IF NO ERROR, PROCEED
7103  032354                          ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
7104  032354  104410                                                          TRAP    C$ESCAPE
7105  032356  001000                                                          .WORD   L10074-.
7106  032360  103425                  BCS     21$             ;IF SET, READING T1CH DIDN'T CLEAR IT -- OK!
7107  032362  004537  004064          JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
7108  032366  120006                  T1LL
7109  032370  002454                  TMP6
7110  032372  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
7111  032374                          ERROR                   ;ELSE, REPORT IT
```

```
7112  032374  104460                                                          TRAP    C$ERROR
7113  032376                        ESCAPE  TST             ;       AND EXIT THIS TEST
7114  032376  104410                                                          TRAP    C$ESCAPE
7115  032400  003456                                                          .WORD   L10073-.
7116  032402  004537  004064        JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
7117  032406  120007                T1LH
7118  032410  002456                TMP7
7119  032412  103003                BCC     .+10            ;IF NO ERROR, PROCEED
7120  032414                        ERROR                   ;ELSE, REPORT IT
7121  032414  104460                                                          TRAP    C$ERROR
7122  032416                        ESCAPE  TST             ;       AND EXIT THIS TEST
7123  032416  104410                                                          TRAP    C$ESCAPE
7124  032420  003436                                                          .WORD   L10073-.
7125  032422                        GEDF    EM50G,ERR50     ;IF CLEARED!  BAD VIA CHIP!
7126                                                        ;       'DEVICE FATAL'' ERROR # 57
7127  032422  104455                                                          TRAP    C$ERDF
7128  032424  000071                                                          .WORD   57
7129  032426  016406                                                          .WORD   EM50G
7130  032430  010762                                                          .WORD   ERR50
7131  032432  000507                BR      28$             ;BYPASS THE REST OF THIS SECTION OF TESTING
7132
7133  032434  004537  004064  21$:  JSR     R5,READ         ;READ T1L-L (ADDR 06)
7134  032440  120006                T1LL
7135  032442  002454                TMP6                    ;THIS SHOULD RETURN A 001
7136  032444  103003                BCC     .+10            ;IF NO ERROR, PROCEED
7137  032446                        ERROR                   ;ELSE, REPORT IT
7138  032446  104460                                                          TRAP    C$ERROR
7139  032450                        ESCAPE  TST             ;       AND EXIT THIS TEST
7140  032450  104410                                                          TRAP    C$ESCAPE
7141  032452  003404                                                          .WORD   L10073-.
7142  032454  123737  002454  032150  CMPB    TMP6,18$        ;CHECK T1L-L (ADDR 06) AGAINST LOADED VALUE
7143  032462  001415                BEQ     23$             ;IF SAME, PROCEED
7144  032464  004537  004064        JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
7145  032470  120007                T1LH
7146  032472  002456                TMP7
7147  032474  103003                BCC     .+10            ;IF NO ERROR, PROCEED
7148  032476                        ERROR                   ;ELSE, REPORT IT
7149  032476  104460                                                          TRAP    C$ERROR
7150  032500                        ESCAPE  TST             ;       AND EXIT THIS TEST
7151  032500  104410                                                          TRAP    C$ESCAPE
7152  032502  003354                                                          .WORD   L10073-.
7153  032504                        GEDF    EM50H,ERR50     ;ELSE, REPORT BAD LOAD OF T1L-L (ADDR 06)
7154                                                        ;       'DEVICE FATAL'' ERROR # 58
7155  032504  104455                                                          TRAP    C$ERDF
7156  032506  000072                                                          .WORD   58
7157  032510  016450                                                          .WORD   EM50H
7158  032512  010762                                                          .WORD   ERR50
7159  032514  000456                BR      28$             ;BYPASS THE REST OF THIS SECTION OF TESTING
7160
7161  032516  004737  036112  23$:  JSR     PC,GETT1        ;IS 'T1'' STILL SET?
7162  032522  102002                BVC     .+6             ;IF NO ERROR, PROCEED
7163  032524                        ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
7164  032524  104410                                                          TRAP    C$ESCAPE
7165  032526  000630                                                          .WORD   L10074-.
7166  032530  103415                BCS     24$             ;YES, ALL'S OK
7167  032532  004537  004064        JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
```

```
7168  032536  120007                  T1LH
7169  032540  002456                  TMP7
7170  032542  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
7171  032544                          ERROR                   ;ELSE, REPORT IT
7172  032544  104460                                                  TRAP    C$ERROR
7173  032546                          ESCAPE  TST             ;       AND EXIT THIS TEST
7174  032546  104410                                                  TRAP    C$ESCAPE
7175  032550  003306                                                  .WORD   L10073-.
7176  032552                          GEDF    EM50I,ERR50     ;NO!  BAD VIA CHIP!
7177                                                          ;       'DEVICE FATAL'' ERROR # 59
7178  032552  104455                                                  TRAP    C$ERDF
7179  032554  000073                                                  .WORD   59
7180  032556  016536                                                  .WORD   EM50I
7181  032560  010762                                                  .WORD   ERR50
7182  032562  000433                  BR      28$             ;BYPASS THE REST OF THIS SECTION OF TESTING
7183
7184  032564  004537  004064  24$:    JSR     R5,READ         ;READ T1L-H (ADDR 07)
7185  032570  120007                  T1LH
7186  032572  002456                  TMP7                    ;THIS SHOULD RETURN A 000
7187  032574  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
7188  032576                          ERROR                   ;ELSE, REPORT IT
7189  032576  104460                                                  TRAP    C$ERROR
7190  032600                          ESCAPE  TST             ;       AND EXIT THIS TEST
7191  032600  104410                                                  TRAP    C$ESCAPE
7192  032602  003254                                                  .WORD   L10073-.
7193  032604  123737  002456  032151        CMPB    TMP7,19$        ;CHECK T1L-H (ADDR 07) AGAINST LOADED VALUE
7194  032612  001405                  BEQ     26$             ;IF SAME, PROCEED
7195  032614                          GEDF    EM50J,ERR50     ;ELSE, REPORT BAD LOAD OF T1L-H (ADDR 07)
7196                                                          ;       'DEVICE FATAL'' ERROR # 60
7197  032614  104455                                                  TRAP    C$ERDF
7198  032616  000074                                                  .WORD   60
7199  032620  016600                                                  .WORD   EM50J
7200  032622  010762                                                  .WORD   ERR50
7201  032624  000412                  BR      28$             ;BYPASS THE REST OF THIS SECTION OF TESTING
7202
7203  032626  004737  036112  26$:    JSR     PC,GETT1        ;IS 'T1'' STILL SET?
7204  032632  102002                  BVC     .+6             ;IF NO ERROR, PROCEED
7205  032634                          ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
7206  032634  104410                                                  TRAP    C$ESCAPE
7207  032636  000520                                                  .WORD   L10074-.
7208  032640  103404                  BCS     28$             ;YES. ALL'S OK
7209  032642                          GEDF    EM50K,ERR50     ;NO!  BAD VIA CHIP!
7210                                                          ;       'DEVICE FATAL'' ERROR # 61
7211  032642  104455                                                  TRAP    C$ERDF
7212  032644  000075                                                  .WORD   61
7213  032646  016666                                                  .WORD   EM50K
7214  032650  010762                                                  .WORD   ERR50
7215
7216                          ;-----------------------------------------------------------------------
7217
7218  032652  004537  004064  28$:    JSR     R5,READ         ;READ T1C-L (ADDR 04)
7219  032656  120004                  T1CL                    ;(THIS VALUE ISN'T CHECKED BECAUSE IT CAN BE
7220  032660  002450                  TMP4                    ; ALMOST ANYTHING)
7221  032662  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
7222  032664                          ERROR                   ;ELSE, REPORT IT
7223  032664  104460                                                  TRAP    C$ERROR
```

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7224  032666
7225  032666  104410                          ESCAPE  TST             ;       AND EXIT THIS TEST
                                                                              TRAP    C$ESCAPE
7226  032670  003166                                                      .WORD   L10073-.
7227  032672  004737  036112                  JSR     PC,GETT1        ;IS 'T1' CLEARED NOW
7228  032676  102002                          BVC     .+6             ;IF NO ERROR, PROCEED
7229  032700                                  ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
7230  032700  104410                                                          TRAP    C$ESCAPE
7231  032702  000454                                                      .WORD   L10074-.
7232  032704  103024                          BCC     29$             ;YES, ALL'S OK
7233  032706  004537  004064                  JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
7234  032712  120006                          T1LL
7235  032714  002454                          TMP6
7236  032716  103003                          BCC     .+10            ;IF NO ERROR, PROCEED
7237  032720                                  ERROR                   ;ELSE, REPORT IT
7238  032720  104460                                                          TRAP    C$ERROR
7239  032722                                  ESCAPE  TST             ;       AND EXIT THIS TEST
7240  032722  104410                                                          TRAP    C$ESCAPE
7241  032724  003132                                                      .WORD   L10073-.
7242  032726  004537  004064                  JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
7243  032732  120007                          T1LH
7244  032734  002456                          TMP7
7245  032736  103003                          BCC     .+10            ;IF NO ERROR, PROCEED
7246  032740                                  ERROR                   ;ELSE, REPORT IT
7247  032740  104460                                                          TRAP    C$ERROR
7248  032742                                  ESCAPE  TST             ;       AND EXIT THIS TEST
7249  032742  104410                                                          TRAP    C$ESCAPE
7250  032744  003112                                                      .WORD   L10073-.
7251  032746                                  GEDF    EM50C,ERR50     ;NO!  BAD VIA CHIP!
7252                                                                  ;       'DEVICE FATAL'' ERROR # 62
7253  032746  104455                                                          TRAP    C$ERDF
7254  032750  000076                                                          .WORD   62
7255  032752  016203                                                          .WORD   EM50C
7256  032754  010762                                                          .WORD   ERR50
7257
7258                            ;-----------------------------------------------------------------------
7259
7260  032756  004537  004310    29$:    JSR     R5,WRITE        ;RE-WRITE INTO T1C-H (ADDR 05) TO SET T1 AGAIN
7261  032762  120005                            T1CH
7262  032764  002453                            TMP5+1
7263  032766  103003                    BCC     .+10            ;IF NO ERROR, PROCEED
7264  032770                            ERROR                   ;ELSE, REPORT IT
7265  032770  104460                                                          TRAP    C$ERROR
7266  032772                            ESCAPE  TST             ;       AND EXIT THIS TEST
7267  032772  104410                                                          TRAP    C$ESCAPE
7268  032774  003062                                                      .WORD   L10073-.
7269  032776  004737  036112            JSR     PC,GETT1        ;IS 'T1' SET AGAIN
7270  033002  102002                    BVC     .+6             ;IF NO ERROR, PROCEED
7271  033004                            ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
7272  033004  104410                                                          TRAP    C$ESCAPE
7273  033006  000350                                                      .WORD   L10074-.
7274  033010  103426                    BCS     32$             ;YES, ALL'S WELL (AGAIN?)
7275  033012  004537  004064            JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
7276  033016  120006                            T1LL
7277  033020  002454                            TMP6
7278  033022  103003                    BCC     .+10            ;IF NO ERROR, PROCEED
7279  033024                            ERROR                   ;ELSE, REPORT IT
```

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7280  033024  104460                                                          TRAP    C$ERROR
7281  033026
7282  033026  104410                                                          TRAP    C$ESCAPE
7283  033030  003026                                                          .WORD   L10073-.
7284  033032  004537  004064      JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
7285  033036  120007              T1LH
7286  033040  002456              TMP7
7287  033042  103003              BCC     .+10            ;IF NO ERROR, PROCEED
7288  033044                      ERROR                   ;ELSE, REPORT IT
7289  033044  104460                                                          TRAP    C$ERROR
7290  033046                      ESCAPE  TST             ;       AND EXIT THIS TEST
7291  033046  104410                                                          TRAP    C$ESCAPE
7292  033050  003006                                                          .WORD   L10073-.
7293  033052                      GEDF    EM50L,ERR50     ;NO!  SOMETHING WENT WRONG!  REPORT IT
7294                                                      ;       'DEVICE FATAL" ERROR # 63
7295  033052  104455                                                          TRAP    C$ERDF
7296  033054  000077                                                          .WORD   63
7297  033056  016730                                                          .WORD   EM50L
7298  033060  010762                                                          .WORD   ERR50
7299  033062                      ESCAPE  SUB             ;       AND EXIT FROM THIS SUBTEST
7300  033062  104410                                                          TRAP    C$ESCAPE
7301  033064  000272                                                          .WORD   L10074-.
7302
7303                      ;-----------------------------------------------------------------
7304
7305  033066  112737  000125  002455  32$:  MOVB    #125,TMP6+1     ;USING A DIFFERENT VALUE -- 55 HEX.,
7306  033074  004537  004310              JSR     R5,WRITE        ;RE-LOAD T1L-L (ADDR 06)
7307  033100  120006              T1LL
7308  033102  002455              TMP6+1
7309  033104  103003              BCC     .+10            ;IF NO ERROR, PROCEED
7310  033106                      ERROR                   ;ELSE, REPORT IT
7311  033106  104460                                                          TRAP    C$ERROR
7312  033110                      ESCAPE  TST             ;       AND EXIT THIS TEST
7313  033110  104410                                                          TRAP    C$ESCAPE
7314  033112  002744                                                          .WORD   L10073-.
7315  033114  004737  036112      JSR     PC,GETT1        ;IS "T1" STILL SET?
7316  033120  102002              BVC     .+6             ;IF NO ERROR, PROCEED
7317  033122                      ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
7318  033122  104410                                                          TRAP    C$ESCAPE
7319  033124  000232                                                          .WORD   L10074-.
7320  033126  103426              BCS     33$             ;YES, ALL'S STILL OK
7321  033130  004537  004064      JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
7322  033134  120006              T1LL
7323  033136  002454              TMP6
7324  033140  103003              BCC     .+10            ;IF NO ERROR, PROCEED
7325  033142                      ERROR                   ;ELSE, REPORT IT
7326  033142  104460                                                          TRAP    C$ERROR
7327  033144                      ESCAPE  TST             ;       AND EXIT THIS TEST
7328  033144  104410                                                          TRAP    C$ESCAPE
7329  033146  002710                                                          .WORD   L10073-.
7330  033150  004537  004064      JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
7331  033154  120007              T1LH
7332  033156  002456              TMP7
7333  033160  103003              BCC     .+10            ;IF NO ERROR, PROCEED
7334  033162                      ERROR                   ;ELSE, REPORT IT
7335  033162  104460                                                          TRAP    C$ERROR
```

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7336  033164                        ESCAPE  TST             ;       AND EXIT THIS TEST
7337  033164  104410                                                        TRAP    C$ESCAPE
7338  033166  002670                                                        .WORD   L10073-.
7339  033170                        GEDF    EM50M,ERR50     ;NO!  SOMETHING WENT WRONG!  REPORT IT
7340                                                        ;       "DEVICE FATAL" ERROR # 64
7341  033170  104455                                                        TRAP    C$ERDF
7342  033172  000100                                                        .WORD   64
7343  033174  017012                                                        .WORD   EM50M
7344  033176  010762                                                        .WORD   ERR50
7345  033200                        ESCAPE  SUB             ;       AND EXIT FROM THIS SUBTEST
7346  033200  104410                                                        TRAP    C$ESCAPE
7347  033202  000154                                                        .WORD   L10074-.
7348
7349                                ;-------------------------------------------------------------------------
7350
7351  033204  112737  000125  002453  33$:   MOVB    #125,TMP5+1     ;AND USING THE SAME VALUE AGAIN (55 HEX),
7352  033212  004537  004310              JSR     R5,WRITE        ;NOW LOAD T1C-H (ADDR 05)
7353  033216  120005                      T1CH
7354  033220  002453                      TMP5+1
7355  033222  103003                      BCC     .+10            ;IF NO ERROR, PROCEED
7356  033224                              ERROR                   ;ELSE, REPORT IT
7357  033224  104460                                                        TRAP    C$ERROR
7358  033226                        ESCAPE  TST             ;       AND EXIT THIS TEST
7359  033226  104410                                                        TRAP    C$ESCAPE
7360  033230  002626                                                        .WORD   L10073-.
7361  033232  004737  036112              JSR     PC,GETT1        ;"T1" SHOULD NOW BE CLEARED
7362  033236  102002                      BVC     .+6             ;IF NO ERROR, PROCEED
7363  033240                              ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
7364  033240  104410                                                        TRAP    C$ESCAPE
7365  033242  000114                                                        .WORD   L10074-.
7366  033244  103044                      BCC     34$             ;IT WAS, ALL'S WELL THAT END'S WELL (I THINK!?)
7367  033246  004537  004064              JSR     R5,READ         ;GET T1CL FOR ERROR MESSAGE
7368  033252  120004                      T1CL
7369  033254  002450                      TMP4
7370  033256  103003                      BCC     .+10            ;IF NO ERROR, PROCEED
7371  033260                              ERROR                   ;ELSE, REPORT IT
7372  033260  104460                                                        TRAP    C$ERROR
7373  033262                        ESCAPE  TST             ;       AND EXIT THIS TEST
7374  033262  104410                                                        TRAP    C$ESCAPE
7375  033264  002572                                                        .WORD   L10073-.
7376  033266  004737  004064              JSR     R5,READ         ;GET T1CH FOR ERROR MESSAGE
7377  033272  120005                      T1CH
7378  033274  002452                      TMP5
7379  033276  103003                      BCC     .+10            ;IF NO ERROR, PROCEED
7380  033300                              ERROR                   ;ELSE, REPORT IT
7381  033300  104460                                                        TRAP    C$ERROR
7382  033302                        ESCAPE  TST             ;       AND EXIT THIS TEST
7383  033302  104410                                                        TRAP    C$ESCAPE
7384  033304  002552                                                        .WORD   L10073-.
7385  033306  004537  004064              JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
7386  033312  120006                      T1LL
7387  033314  002454                      TMP6
7388  033316  103003                      BCC     .+10            ;IF NO ERROR, PROCEED
7389  033320                              ERROR                   ;ELSE, REPORT IT
7390  033320  104460                                                        TRAP    C$ERROR
7391  033322                        ESCAPE  TST             ;       AND EXIT THIS TEST
```

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

                                                                        TRAP    C$ESCAPE
                                                                        .WORD   L10073-.
7392  033322  104410
7393  033324  002532
7394  033326  004537  004064      JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
7395  033332  120007              T1LH
7396  033334  002456              TMP7
7397  033336  103003              BCC     .+10            ;IF NO ERROR, PROCEED
7398  033340                      ERROR                   ;ELSE, REPORT IT
                                                                        TRAP    C$ERROR
7399  033340  104460
7400  033342                      ESCAPE  TST             ;       AND EXIT THIS TEST
                                                                        TRAP    C$ESCAPE
7401  033342  104410
7402  033344  002512                                                    .WORD   L10073-.
7403  033346                      GEDF    EM5ON,ERR50     ;IT WASN'T!  SOMETHING WENT WRONG!  REPORT IT
7404                                                      ;       'DEVICE FATAL'' ERROR # 65
7405  033346  104455                                                   TRAP    C$ERDF
7406  033350  000101                                                   .WORD   65
7407  033352  017054                                                   .WORD   EM5ON
7408  033354  010762                                                   .WORD   ERR50
7409
7410  033356              34$:    ENDSUB
7411  033356                                                  L10074:
7412  033356  104403                                                   TRAP    C$ESUB
7413                      ;=============================================================
7414
7415                      ; TEST TIMER # 1 USING ONE-SHOT MODE WITH OUTPUT ON PB7 ENABLED.
7416
7417  033360              BGNSUB
7418  033360                                                  T27.2:
7419  033360  104402                                                   TRAP    C$BSUB
7420  033362  004737  003762      JSR     PC,MSTCLR       ;INIT DMV & ENTER M-LOOP
7421  033366  103003              BCC     1$              ;IF NO ERROR, PROCEED WITH TESTING
7422  033370                      ERROR                   ;ELSE, REPORT ERROR
                                                                        TRAP    C$ERROR
7423  033370  104460
7424  033372                      ESCAPE  TST             ;   & EXIT TEST
                                                                        TRAP    C$ESCAPE
7425  033372  104410
7426  033374  002462                                                   .WORD   L10073-.
7427  033376  004537  004660  1$: JSR     R5,INITT1       ;INITIALIZE TIMER # 1
7428  033402  000000              0                       ;       0 ==> LATCHES
7429  033404  000200              BIT7                    ;       MODE 2 & 'T1'' INT. ENABLE FLAG CLEARED
7430  033406  103003              BCC     .+10            ;IF NO ERROR, PROCEED
7431  033410                      ERROR                   ;ELSE, REPORT IT
                                                                        TRAP    C$ERROR
7432  033410  104460
7433  033412                      ESCAPE  TST             ;       AND EXIT THIS TEST
                                                                        TRAP    C$ESCAPE
7434  033412  104410
7435  033414  002442                                                   .WORD   L10073-.
7436
7437                      ; MODE 2 IS ONE-SHOT MODE WITH OUTPUT ON PB7 CONTROLED BY TIMER 1
7438
7439  033416  004737  036112      JSR     PC,GETT1        ;IS 'T1'' SET?
7440  033422  102002              BVC     .+6             ;IF NO ERROR, PROCEED
7441  033424                      ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
                                                                        TRAP    C$ESCAPE
7442  033424  104410
7443  033426  002426                                                   .WORD   L10075-.
7444  033430  103123              BCC     6$              ;NO, GOOD.
7445                                                      ;YES, REPORT IT'S NOT BEING CLEARED @ INIT.
7446  033432  004537  004064      JSR     R5,READ         ;GET ACR FOR ERROR MESSAGE
7447  033436  120013              ACR
```

```
7448  033440  002466
7449  033442  103003                TMPB
7450  033444                      BCC     .+10            ;IF NO ERROR, PROCEED
7451  033444  104460              ERROR,                  ;ELSE, REPORT IT
                                                                    TRAP    C$ERROR
7452  033446                      ESCAPE  TST             ;       AND EXIT THIS TEST
7453  033446  104410                                              TRAP    C$ESCAPE
7454  033450  002406                                              .WORD   L10073-.
7455  033452  004537  004064      JSR     R5,READ         ;GET T1CL FOR ERROR MESSAGE
7456  033456  120004              T1CL
7457  033460  002450              TMP4
7458  033462  103003              BCC     .+10            ;IF NO ERROR, PROCEED
7459  033464                      ERROR                   ;ELSE, REPORT IT
                                                                    TRAP    C$ERROR
7460  033464  104460              ESCAPE  TST             ;       AND EXIT THIS TEST
7461  033466                                              TRAP    C$ESCAPE
7462  033466  104410                                              .WORD   L10073-.
7463  033470  002366
7464  033472  004537  004064      JSR     R5,READ         ;GET T1CH FOR ERROR MESSAGE
7465  033476  120005              T1CH
7466  033500  002452              TMP5
7467  033502  103003              BCC     .+10            ;IF NO ERROR, PROCEED
7468  033504                      ERROR                   ;ELSE, REPORT IT
                                                                    TRAP    C$ERROR
7469  033504  104460              ESCAPE  TST             ;       AND EXIT THIS TEST
7470  033506                                              TRAP    C$ESCAPE
7471  033506  104410                                              .WORD   L10073-.
7472  033510  002346
7473  033512  004537  004064      JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
7474  033516  120006              T1LL
7475  033520  002454              TMP6
7476  033522  103003              BCC     .+10            ;IF NO ERROR, PROCEED
7477  033524                      ERROR                   ;ELSE, REPORT IT
                                                                    TRAP    C$ERROR
7478  033524  104460              ESCAPE  TST             ;       AND EXIT THIS TEST
7479  033526                                              TRAP    C$ESCAPE
7480  033526  104410                                              .WORD   L10073-.
7481  033530  002326
7482  033532  004537  004064      JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
7483  033536  120007              T1LH
7484  033540  002456              TMP7
7485  033542  103003              BCC     .+10            ;IF NO ERROR, PROCEED
7486  033544                      ERROR                   ;ELSE, REPORT IT
                                                                    TRAP    C$ERROR
7487  033544  104460              ESCAPE  TST             ;       AND EXIT THIS TEST
7488  033546                                              TRAP    C$ESCAPE
7489  033546  104410                                              .WORD   L10073-.
7490  033550  002306
7491  033552                      GEDF    EM50A,ERR50     ;REPORT 'T1'' NOT CLEARED @ INIT.
7492                                                      ;       'DEVICE FATAL'' ERROR # 66
7493  033552  104455                                              TRAP    C$ERDF
7494  033554  000102                                              .WORD   66
7495  033556  016067                                              .WORD   EM50A
7496  033560  010762                                              .WORD   ERR50
7497
7498                        ;-----------------------------------------------------------------------
7499
7500  033562  112737  000002  002453      MOVB    #2,TMP5+1
7501  033570  004537  004310              JSR     R5,WRITE        ;INIT TIMER # 1 BY WRITING INTO
7502  033574  120005                      T1CH                    ;T1C-H (ADDR 05)
7503  033576  002453                      TMP5+1
```

```
7504  033600  103003                BCC     .+10            ;IF NO ERROR, PROCEED
7505  033602                        ERROR                   ;ELSE, REPORT IT
7506  033602  104460                                                        TRAP    C$ERROR
7507  033604                        ESCAPE  TST             ;       AND EXIT THIS TEST
7508  033604  104410                                                        TRAP    C$ESCAPE
7509  033606  002250                                                        .WORD   L10073-.
7510  033610  004737  036112        JSR     PC,GETT1        ;IS 'T1' SET?
7511  033614  102002                BVC     .+6             ;IF NO ERROR, PROCEED
7512  033616                        ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
7513  033616  104410                                                        TRAP    C$ESCAPE
7514  033620  002234                                                        .WORD   L10075-.
7515  033622  103026                BCC     6$              ;NO, GOOD.
7516                                                        ;YES, REPORT IT'S NOT BEING CLEARED @ INIT.
7517  033624  004537  004064        JSR     R5,READ         ;GET T1CH FOR ERROR MESSAGE
7518  033630  120005                T1CH
7519  033632  002452                TMP5
7520  033634  103003                BCC     .+10            ;IF NO ERROR, PROCEED
7521  033636                        ERROR                   ;ELSE, REPORT IT
7522  033636  104460                                                        TRAP    C$ERROR
7523  033640                        ESCAPE  TST             ;       AND EXIT THIS TEST
7524  033640  104410                                                        TRAP    C$ESCAPE
7525  033642  002214                                                        .WORD   L10073-.
7526  033644  004537  004064        JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
7527  033650  120007                T1LH
7528  033652  002456                TMP7
7529  033654  103003                BCC     .+10            ;IF NO ERROR, PROCEED
7530  033656                        ERROR                   ;ELSE, REPORT IT
7531  033656  104460                                                        TRAP    C$ERROR
7532  033660                        ESCAPE  TST             ;       AND EXIT THIS TEST
7533  033660  104410                                                        TRAP    C$ESCAPE
7534  033662  002174                                                        .WORD   L10073-.
7535  033664                        GEDF    EM50B,ERR50     ;REPORT 'T1' NOT CLEARED @ INIT.
7536                                                        ;       'DEVICE FATAL' ERROR # 67
7537  033664  104455                                                        TRAP    C$ERDF
7538  033666  000103                                                        .WORD   67
7539  033670  016135                                                        .WORD   EM50B
7540  033672  010762                                                        .WORD   ERR50
7541  033674                        ESCAPE  SUB             ;AND EXIT SUBTEST
7542  033674  104410                                                        TRAP    C$ESCAPE
7543  033676  002156                                                        .WORD   L10075-.
7544
7545                          ;-----------------------------------------------------------------
7546
7547  033700  004737  003762  6$:   JSR     PC,MSTCLR       ;INIT DMV & ENTER M-LOOP AGAIN
7548  033704  112737  000377  002445  MOVB    #377,TMP2+1     ;INITIAL VALUE FOR DDRB
7549  033712  004537  004310        JSR     R5,WRITE        ;LOAD IT
7550  033716  120002                DDRB
7551  033720  002445                TMP2+1
7552  033722  103003                BCC     .+10            ;IF NO ERROR, PROCEED
7553  033724                        ERROR                   ;ELSE, REPORT IT
7554  033724  104460                                                        TRAP    C$ERROR
7555  033726                        ESCAPE  TST             ;       AND EXIT THIS TEST
7556  033726  104410                                                        TRAP    C$ESCAPE
7557  033730  002126                                                        .WORD   L10073-.
7558  033732  004537  004660        JSR     R5,INITT1       ;RE-INITIALIZE THE TIMER
7559  033736  000000                0                       ;       FOR MAXIMUM TIMEOUT
```

```
7560  033740  000200                  BIT7                    ;       MODE 2 & CLEARED 'T1'' INT. FLAG
7561  033742  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
7562  033744                          ERROR                   ;ELSE, REPORT IT
7563  033744  104460                                                          TRAP    C$ERROR
7564  033746                          ESCAPE  TST             ;       AND EXIT THIS TEST
7565  033746  104410                                                          TRAP    C$ESCAPE
7566  033750  002106                                                          .WORD   L10073-.
7567  033752  004537  004064          JSR     R5,READ         ;GET ACR FOR FUTURE ERROR MESSAGES
7568  033756  120013                  ACR
7569  033760  002466                  TMPB
7570  033762  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
7571  033764                          ERROR                   ;ELSE, REPORT IT
7572  033764  104460                                                          TRAP    C$ERROR
7573  033766                          ESCAPE  TST             ;       AND EXIT THIS TEST
7574  033766  104410                                                          TRAP    C$ESCAPE
7575  033770  002066                                                          .WORD   L10073-.
7576  033772  004537  036060          JSR     R5,LODT1C       ;LOAD TIMER # 1
7577  033776     252  7$:     .BYTE   252
7578  033777     252  8$:     .BYTE   252
7579
7580                  ;-----------------------------------------------------------------------
7581
7582  034000  004737  036276          JSR     PC,GETPB7       ;GET 'PB7''.  IS IT CLEARED?
7583  034004  102002                  BVC     .+6             ;IF NO ERROR, PROCEED
7584  034006                          ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
7585  034006  104410                                                          TRAP    C$ESCAPE
7586  034010  002044                                                          .WORD   L10075-.
7587  034012  103066                  BCC     9$              ;IT IS, GOOD
7588  034014  004537  004064          JSR     R5,READ         ;GET IFR FOR ERROR MESSAGE
7589  034020  120015                  IFR
7590  034022  002472                  TMPD
7591  034024  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
7592  034026                          ERROR                   ;ELSE, REPORT IT
7593  034026  104460                                                          TRAP    C$ERROR
7594  034030                          ESCAPE  TST             ;       AND EXIT THIS TEST
7595  034030  104410                                                          TRAP    C$ESCAPE
7596  034032  002024                                                          .WORD   L10073-.
7597  034034  004537  004064          JSR     R5,READ         ;GET T1CL FOR ERROR MESSAGE
7598  034040  120004                  T1CL
7599  034042  002450                  TMP4
7600  034044  103003                  BCC     .+10            ;I' NO ERROR, PROCEED
7601  034046                          ERROR                   ;ELSE, REPORT IT
7602  034046  104460                                                          TRAP    C$ERROR
7603  034050                          ESCAPE  TST             ;       AND EXIT THIS TEST
7604  034050  104410                                                          TRAP    C$ESCAPE
7605  034052  002004                                                          .WORD   L10073-.
7606  034054  004537  004064          JSR     R5,READ         ;GET T1CH FOR ERROR MESSAGE
7607  034060  120005                  T1CH
7608  034062  002452                  TMP5
7609  034064  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
7610  034066                          ERROR                   ;ELSE, REPORT IT
7611  034066  104460                                                          TRAP    C$ERROR
7612  034070                          ESCAPE  TST             ;       AND EXIT THIS TEST
7613  034070  104410                                                          TRAP    C$ESCAPE
7614  034072  001764                                                          .WORD   L10073-.
7615  034074  004537  004064          JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
```

```
7616  034100  120006                  T1LL
7617  034102  002454                  TMP6
7618  034104  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
7619  034106                          ERROR                   ;ELSE, REPORT IT
7620  034106  104460                                                          TRAP    C$ERROR
7621  034110                          ESCAPE  TST             ;       AND EXIT THIS TEST
7622  034110  104410                                                          TRAP    C$ESCAPE
7623  034112  001744                                                          .WORD   L10073-.
7624  034114  004537  004064          JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
7625  034120  120007                  T1LH
7626  034122  002456                  TMP7
7627  034124  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
7628  034126                          ERROR                   ;ELSE, REPORT IT
7629  034126  104460                                                          TRAP    C$ERROR
7630  034130                          ESCAPE  TST             ;       AND EXIT THIS TEST
7631  034130  104410                                                          TRAP    C$ESCAPE
7632  034132  001724                                                          .WORD   L10073-.
7633  034134                          GEDF    EM50V,ERR50     ;NO, STILL(?) SET!
7634                                                          ;       'DEVICE FATAL'' ERROR # 68
7635  034134  104455                                                          TRAP    C$ERDF
7636  034136  000104                                                          .WORD   68
7637  034140  017240                                                          .WORD   EM50V
7638  034142  010762                                                          .WORD   ERR50
7639  034144  004737  036150          JSR     PC,KICKT1       ;BECAUSE THE ERROR MESSAGE TAKES SO LONG TO
7640  034150  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
7641  034152                          ERROR                   ;ELSE, REPORT IT
7642  034152  104460                                                          TRAP    C$ERROR
7643  034154                          ESCAPE  TST             ;       AND EXIT THIS TEST
7644  034154  104410                                                          TRAP    C$ESCAPE
7645  034156  001700                                                          .WORD   L10073-.
7646  034160  004737  005032          JSR     PC,STALL        ;  PROCESS & PRINT, RE-START THE TIMER AND THEN
7647  034164  004737  005032          JSR     PC,STALL        ;  DELAY FOR A LITTLE WHILE SO IT CAN DECREMENT
7648  034170  004537  004064  9$:     JSR     R5,READ         ;READ THE LOW COUNTER
7649  034174  120004                  T1CL
7650  034176  002450                  TMP4
7651  034200  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
7652  034202                          ERROR                   ;ELSE, REPORT IT
7653  034202  104460                                                          TRAP    C$ERROR
7654  034204                          ESCAPE  TST             ;       AND EXIT THIS TEST
7655  034204  104410                                                          TRAP    C$ESCAPE
7656  034206  001650                                                          .WORD   L10073-.
7657  034210  123737  002450  033776  CMPB    TMP4,7$         ;MAKE SURE THE COUNTER IS DECREMENTING
7658  034216  001012                  BNE     12$             ;IT IS, NOW SEE IF THE HIGH COUNTER IS TOO
7659  034220                          GEDF    EM50D,ERR50     ;IT WASN'T -- REPORT THE ERROR
7660                                                          ;       'DEVICE FATAL'' ERROR # 69
7661  034220  104455                                                          TRAP    C$ERDF
7662  034222  000105                                                          .WORD   69
7663  034224  016251                                                          .WORD   EM50D
7664  034226  010762                                                          .WORD   ERR50
7665  034230  004737  036150          JSR     PC,KICKT1       ;RESTART TIMER AGAIN IF ERROR MESSAGE PRINTED
7666  034234  103003                  BCC     12$             ;IF NO ERROR, PROCEED
7667  034236                          ERROR                   ;ELSE, REPORT IT
7668  034236  104460                                                          TRAP    C$ERROR
7669  034240                          ESCAPE  TST             ;       AND EXIT THIS TEST
7670  034240  104410                                                          TRAP    C$ESCAPE
7671  034242  001614                                                          .WORD   L10073-.
```

```
7672  034244  012703  000100        12$:    MOV     #100,R3         ;INIT. TIMEOUT VALUE
7673  034250  004537  004064        13$:    JSR     R5,READ         ;READ THE HIGH COUNTER
7674  034254  120005                        T1CH
7675  034256  002452                        TMP5
7676  034260  103003                        BCC     .+10            ;IF NO ERROR, PROCEED
7677  034262                                ERROR                   ;ELSE, REPORT IT
7678  034262  104460                                                                TRAP    C$ERROR
7679  034264                                ESCAPE  TST             ;       AND EXIT THIS TEST
7680  034264  104410                                                                TRAP    C$ESCAPE
7681  034266  001570                                                                .WORD   L10073-.
7682  034270  123737  002452  033777        CMPB    TMP5,8$         ;DID IT CHANGE FROM THE LOADED VALUE?
7683  034276  001027                        BNE     17$             ;YES, PROCEED WITH TESTING
7684  034300  077315                        SOB     R3,13$          ;NO,  IF NO TIMEOUT, TRY AGAIN
7685  034302  004537  004064                JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
7686  034306  120006                        T1LL
7687  034310  002454                        TMP6
7688  034312  103003                        BCC     .+10            ;IF NO ERROR, PROCEED
7689  034314                                ERROR                   ;ELSE, REPORT IT
7690  034314  104460                                                                TRAP    C$ERROR
7691  034316                                ESCAPE  TST             ;       AND EXIT THIS TEST
7692  034316  104410                                                                TRAP    C$ESCAPE
7693  034320  001536                                                                .WORD   L10073-.
7694  034322  004537  004064                JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
7695  034326  120007                        T1LH
7696  034330  002456                        TMP7
7697  034332  103003                        BCC     .+10            ;IF NO ERROR, PROCEED
7698  034334                                ERROR                   ;ELSE, REPORT IT
7699  034334  104460                                                                TRAP    C$ERROR
7700  034336                                ESCAPE  TST             ;       AND EXIT THIS TEST
7701  034336  104410                                                                TRAP    C$ESCAPE
7702  034340  001516                                                                .WORD   L10073-.
7703  034342                                GEDF    EM50E,ERR50     ;ELSE, REPORT THAT HIGH COUNTER ISN'T RUNNING
7704                                                                ;       'DEVICE FATAL'' ERROR # 70
7705  034342  104455                                                                TRAP    C$ERDF
7706  034344  000106                                                                .WORD   70
7707  034346  016305                                                                .WORD   EM50E
7708  034350  010762                                                                .WORD   ERR50
7709  034352                                ESCAPE  SUB             ;IN THAT CASE, WE CAN'T PROCEED WITH TESTING EITHER
7710  034352  104410                                                                TRAP    C$ESCAPE
7711  034354  001500                                                                .WORD   L10075-.
7712                                ;-------------------------------------------------------------------------------
7713
7714  034356  112737  000377  002445  17$:    MOVB    #377,TMP2+1     ;SETUP DDRB FOR DESIRED DIRECTION OF ORB
7715  034364  004537  004310                JSR     R5,WRITE
7716  034370  120002                        DDRB
7717  034372  002445                        TMP2+1
7718  034374  103003                        BCC     .+10            ;IF NO ERROR, PROCEED
7719  034376                                ERROR                   ;ELSE, REPORT IT
7720  034376  104460                                                                TRAP    C$ERROR
7721  034400                                ESCAPE  TST             ;       AND EXIT THIS TEST
7722  034400  104410                                                                TRAP    C$ESCAPE
7723  034402  001454                                                                .WORD   L10073-.
7724  034404  004537  036060                JSR     R5,LODT1C       ;RE-LOAD TIMER # 1 WITH A VALUE WHICH WILL
7725  034410     001        18$:    .BYTE   1               ;   CAUSE AN ALMOST IMMEDIATE TIMEOUT
7726  034411     000        19$:    .BYTE   0               ; (ADDRESS OF HIGH BYTE FOR T1C-H (ADDR 05))
7727                                ;-------------------------------------------------------------------------------
```

```
7728
7729  034412  004737  036112          JSR     PC,GETT1        ;WAS 'T1' SET BY THE ABOVE OPERATION?
7730  034416  102002                  BVC     .+6             ;IF NO ERROR, PROCEED
7731  034420                          ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
7732  034420  104410                                                          TRAP    C$ESCAPE
7733  034422  001432                                                          .WORD   L10075-.
7734  034424  103446                  BCS     20$             ;YES, OK -- CONTINUE ERROR CHECKING
7735  034426  004537  004064          JSR     R5,READ         ;GET T1CL FOR ERROR MESSAGE
7736  034432  120004                  T1CL
7737  034434  002450                  TMP4
7738  034436  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
7739  034440                          ERROR                   ;ELSE, REPORT IT
7740  034440  104460                                                          TRAP    C$ERROR
7741  034442                          ESCAPE  TST             ;       AND EXIT THIS TEST
7742  034442  104410                                                          TRAP    C$ESCAPE
7743  034444  001412                                                          .WORD   L10073-.
7744  034446  004537  004064          JSR     R5,READ         ;GET T1CH FOR ERROR MESSAGE
7745  034452  120005                  T1CH
7746  034454  002452                  TMP5
7747  034456  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
7748  034460                          ERROR                   ;ELSE, REPORT IT
7749  034460  104460                                                          TRAP    C$ERROR
7750  034462                          ESCAPE  TST             ;       AND EXIT THIS TEST
7751  034462  104410                                                          TRAP    C$ESCAPE
7752  034464  001372                                                          .WORD   L10073-.
7753  034466  004537  004064          JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
7754  034472  120006                  T1LL
7755  034474  002454                  TMP6
7756  034476  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
7757  034500                          ERROR                   ;ELSE, REPORT IT
7758  034500  104460                                                          TRAP    C$ERROR
7759  034502                          ESCAPE  TST             ;       AND EXIT THIS TEST
7760  034502  104410                                                          TRAP    C$ESCAPE
7761  034504  001352                                                          .WORD   L10073-.
7762  034506  004537  004064          JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
7763  034512  120007                  T1LH
7764  034514  002456                  TMP7
7765  034516  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
7766  034520                          ERROR                   ;ELSE, REPORT IT
7767  034520  104460                                                          TRAP    C$ERROR
7768  034522                          ESCAPE  TST             ;       AND EXIT THIS TEST
7769  034522  104410                                                          TRAP    C$ESCAPE
7770  034524  001332                                                          .WORD   L10073-.
7771  034526                          GEDF    EM50F,ERR50     ;NO,  BAD NEWS!  REPORT THE FAILURE
7772                                                          ;       'DEVICE FATAL" ERROR # 71
7773  034526  104455                                                          TRAP    C$ERDF
7774  034530  000107                                                          .WORD   71
7775  034532  016341                                                          .WORD   EM50F
7776  034534  010762                                                          .WORD   ERR50
7777  034536                          ESCAPE  SUB             ;  AND GET OUT OF SUBTEST
7778  034536  104410                                                          TRAP    C$ESCAPE
7779  034540  001314                                                          .WORD   L10075-.
7780  034542  004737  036276  20$:     JSR     PC,GETPB7       ;GET 'PB7'.  IS IT SET?
7781  034546  102002                  BVC     .+6             ;IF NO ERROR, PROCEED
7782  034550                          ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
7783  034550  104410                                                          TRAP    C$ESCAPE
```

```
034552  001302                                                                          .WORD   L10075-.
034554  103445                          BCS     41$             ;YES, CONTINUE CHECKING "T1"
034556  004537  004064                  JSR     R5,READ         ;GET T1CL FOR ERROR MESSAGE
034562  120004                          T1CL
034564  002450                          TMP4
034566  103003                          BCC     .+10            ;IF NO ERROR, PROCEED
034570                                  ERROR                   ;ELSE, REPORT IT
034570  104460                                                                          TRAP    C$ERROR
034572                                  ESCAPE  TST             ;       AND EXIT THIS TEST
034572  104410                                                                          TRAP    C$ESCAPE
034574  001262                                                                          .WORD   L10073-.
034576  004537  004064                  JSR     R5,READ         ;GET T1CH FOR ERROR MESSAGE
034602  120005                          T1CH
034604  002452                          TMP5
034606  103003                          BCC     .+10            ;IF NO ERROR, PROCEED
034610                                  ERROR                   ;ELSE, REPORT IT
034610  104460                                                                          TRAP    C$ERROR
034612                                  ESCAPE  TST             ;       AND EXIT THIS TEST
034612  104410                                                                          TRAP    C$ESCAPE
034614  001242                                                                          .WORD   L10073-.
034616  004537  004064                  JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
034622  120006                          T1LL
034624  002454                          TMP6
034626  103003                          BCC     .+10            ;IF NO ERROR, PROCEED
034630                                  ERROR                   ;ELSE, REPORT IT
034630  104460                                                                          TRAP    C$ERROR
034632                                  ESCAPE  TST             ;       AND EXIT THIS TEST
034632  104410                                                                          TRAP    C$ESCAPE
034634  001222                                                                          .WORD   L10073-.
034636  004537  004064                  JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
034642  120007                          T1LH
034644  002456                          TMP7
034646  103003                          BCC     .+10            ;IF NO ERROR, PROCEED
034650                                  ERROR                   ;ELSE, REPORT IT
034650  104460                                                                          TRAP    C$ERROR
034652                                  ESCAPE  TST             ;       AND EXIT THIS TEST
034652  104410                                                                          TRAP    C$ESCAPE
034654  001202                                                                          .WORD   L10073-.
034656                                  GEDF    EM50S,ERR50     ;NO!  REPORT THAT PB7 DIDN'T GET SET!
                                                                ;       "DEVICE FATAL" ERROR # 72
034656  104455                                                                          TRAP    C$ERDF
034660  000110                                                                          .WORD   72
034662  017122                                                                          .WORD   EM50S
034664  010762                                                                          .WORD   ERR50
034666  000562                          BR      28$             ;   & EXIT THIS SECTION OF SUBTEST
034670  004537  004064          41$:    JSR     R5,READ         ;READ T1C-H (ADDR 05) TO SEE IF IT CLEARS "T1"
034674  120005                          T1CH                    ;(THIS VALUE ISN'T CHECKED BECAUSE IT CAN BE
034676  002452                          TMP5                    ; ALMOST ANYTHING)
034700  103003                          BCC     .+10            ;IF NO ERROR, PROCEED
034702                                  ERROR                   ;ELSE, REPORT IT
034702  104460                                                                          TRAP    C$ERROR
034704                                  ESCAPE  TST             ;       AND EXIT THIS TEST
034704  104410                                                                          TRAP    C$ESCAPE
034706  001150                                                                          .WORD   L10073-.
034710  004737  036112                  JSR     PC,GETT1        ;PUT THE CURRENT "T1" VALUE INTO THE CARRY BIT
034714  102002                          BVC     11$             ;IF NO ERROR, PROCEED
```

```
7840  034716                          ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
7841  034716  104410                                                          TRAP    C$ESCAPE
7842  034720  001134                                                          .WORD   L10075-.
7843  034722  103435          11$:    BCS     21$             ;IF SET, ALL'S OK
7844                                                          ;IF CLEARED!  BAD VIA CHIP!
7845  034724  004537  004064          JSR     R5,READ         ;GET T1CL FOR ERROR MESSAGE
7846  034730  120004                  T1CL
7847  034732  002470                  TMP4
7848  034734  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
7849  034736                          ERROR                   ;ELSE, REPORT IT
7850  034736  104460                                                          TRAP    C$ERROR
7851  034740                          ESCAPE  TST             ;       AND EXIT THIS TEST
7852  034740  104410                                                          TRAP    C$ESCAPE
7853  034742  001114                                                          .WORD   L10073-.
7854  034744  004537  004064          JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
7855  034750  120006                  T1LL
7856  034752  002454                  TMP6
7857  034754  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
7858  034756                          ERROR                   ;ELSE, REPORT IT
7859  034756  104460                                                          TRAP    C$ERROR
7860  034760                          ESCAPE  TST             ;       AND EXIT THIS TEST
7861  034760  104410                                                          TRAP    C$ESCAPE
7862  034762  001074                                                          .WORD   L10073-.
7863  034764  004537  004064          JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
7864  034770  120007                  T1LH
7865  034772  002456                  TMP7
7866  034774  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
7867  034776                          ERROR                   ;ELSE, REPORT IT
7868  034776  104460                                                          TRAP    C$ERROR
7869  035000                          ESCAPE  TST             ;       AND EXIT THIS TEST
7870  035000  104410                                                          TRAP    C$ESCAPE
7871  035002  001054                                                          .WORD   L10073-.
7872  035004                          GEDF    EM50G,ERR50     ;REPORT BAD VIA CHIP!
7873                                                          ;       'DEVICE FATAL'' ERROR # 73
7874  035004  104455                                                          TRAP    C$ERDF
7875  035006  000111                                                          .WORD   73
7876  035010  016406                                                          .WORD   EM50G
7877  035012  010762                                                          .WORD   ERR50
7878  035014  000507                  BR      28$             ;BYPASS THE REST OF THIS SECTION OF TESTING
7879
7880  035016  004537  004064  21$:    JSR     R5,READ         ;READ T1L-L (ADDR 06)
7881  035022  120006                  T1LL
7882  035024  002454                  TMP6                    ;THIS SHOULD RETURN A 001
7883  035026  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
7884  035030                          ERROR                   ;ELSE, REPORT IT
7885  035030  104460                                                          TRAP    C$ERROR
7886  035032                          ESCAPE  TST             ;       AND EXIT THIS TEST
7887  035032  104410                                                          TRAP    C$ESCAPE
7888  035034  001022                                                          .WORD   L10073-.
7889  035036  123737  002454  034410  CMPB    TMP6,18$        ;CHECK T1L-L (ADDR 06) AGAINST LOADED VALUE
7890  035044  001415                  BEQ     23$             ;IF SAME, PROCEED
7891                                                          ;ELSE, REPORT BAD LOAD OF T1L-L (ADDR 06)
7892  035046  004537  004064          JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
7893  035052  120007                  T1LH
7894  035054  002456                  TMP7
7895  035056  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
```

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7896  035060
7897  035060  104460                        ERROR                   ;ELSE, REPORT IT
                                                                                TRAP    C$ERROR
7898  035062
7899  035062  104410                        ESCAPE  TST             ;       AND EXIT THIS TEST
                                                                                TRAP    C$ESCAPE
7900  035064  000772                                                            .WORD   L10073-.
7901  035066                              GEDF    EM50H,ERR50     ;ELSE, REPORT BAD LOAD OF T1L-L (ADDR 06)
7902                                                              ;       'DEVICE FATAL'' ERROR # 74
7903  035066  104455                                                           TRAP    C$ERDF
7904  035070  000112                                                           .WORD   74
7905  035072  016450                                                           .WORD   EM50H
7906  035074  010762                                                           .WORD   ERR50
7907  035076  000456                        BR      28$             ;BYPASS THE REST OF THIS SECTION OF TESTING
7908
7909  035100  004737  036112      23$:      JSR     PC,GETT1        ;IS 'T1'' STILL SET?
7910  035104  102002                        BVC     .+6             ;IF NO ERROR, PROCEED
7911  035106                              ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
7912  035106  104410                                                           TRAP    C$ESCAPE
7913  035110  000744                                                           .WORD   L10075-.
7914  035112  103415                        BCS     24$             ;YES, ALL'S OK
7915                                                                ;NO!  BAD VIA CHIP!
7916  035114  004537  004064              JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
7917  035120  120007                      T1LH
7918  035122  002456                      TMP7
7919  035124  103003                      BCC     .+10            ;IF NO ERROR, PROCEED
7920  035126                              ERROR                   ;ELSE, REPORT IT
7921  035126  104460                                                           TRAP    C$ERROR
7922  035130
7923  035130  104410                      ESCAPE  TST             ;       AND EXIT THIS TEST
                                                                                TRAP    C$ESCAPE
7924  035132  000724                                                           .WORD   L10073-.
7925  035134                              GEDF    EM50I,ERR50     ;REPORT BAD VIA CHIP!
7926                                                              ;       'DEVICE FATAL'' ERROR # 75
7927  035134  104455                                                           TRAP    C$ERDF
7928  035136  000113                                                           .WORD   75
7929  035140  016536                                                           .WORD   EM50I
7930  035142  010762                                                           .WORD   ERR50
7931  035144  000433                        BR      28$             ;BYPASS THE REST OF THIS SECTION OF TESTING
7932
7933  035146  004537  004064      24$:      JSR     R5,READ         ;READ T1L-H (ADDR 07)
7934  035152  120007                      T1LH
7935  035154  002456                      TMP7                    ;THIS SHOULD RETURN A 000
7936  035156  103003                      BCC     .+10            ;IF NO ERROR, PROCEED
7937  035160                              ERROR                   ;ELSE, REPORT IT
7938  035160  104460                                                           TRAP    C$ERROR
7939  035162
7940  035162  104410                      ESCAPE  TST             ;       AND EXIT THIS TEST
                                                                                TRAP    C$ESCAPE
7941  035164  000672                                                           .WORD   L10073-.
7942  035166  123737  002456  034411      CMPB    TMP7,19$        ;CHECK T1L-H (ADDR 07) AGAINST LOADED VALUE
7943  035174  001405                      BEQ     26$             ;IF SAME, PROCEED
7944  035176                              GEDF    EM50J,ERR50     ;ELSE, REPORT BAD LOAD OF T1L-H (ADDR 07)
7945                                                              ;       'DEVICE FATAL'' ERROR # 76
7946  035176  104455                                                           TRAP    C$ERDF
7947  035200  000114                                                           .WORD   76
7948  035202  016600                                                           .WORD   EM50J
7949  035204  010762                                                           .WORD   ERR50
7950  035206  000412                        BR      28$             ;BYPASS THE REST OF THIS SECTION OF TESTING
7951
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```
7952  035210  004737  036112      26$:    JSR     PC,GETT1        ;IS 'T1' STILL SET?
7953  035214  102002                      BVC     .+6             ;IF NO ERROR, PROCEED
7954  035216                      ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
7955  035216  104410                                                          TRAP    C$ESCAPE
7956  035220  000634                                                          .WORD   L10075-.
7957  035222  103404                      BCS     28$             ;YES, ALL'S OK
7958  035224                              GEDF    EM50K,ERR50     ;NO!  BAD VIA CHIP!
7959                                                              ;       'DEVICE FATAL'' ERROR # 77
7960  035224  104455                                                          TRAP    C$ERDF
7961  035226  000115                                                          .WORD   77
7962  035230  016666                                                          .WORD   EM50K
7963  035232  010762                                                          .WORD   ERR50
7964
7965                              ;-----------------------------------------------------------------------
7966
7967  035234  004537  004064      28$:    JSR     R5,READ         ;READ T1C-L (ADDR 04) TO CLEAR 'T1'
7968  035240  120004                      T1CL                    ;(THIS VALUE ISN'T CHECKED BECAUSE IT CAN BE
7969  035242  002450                      TMP4                    ; ALMOST ANYTHING)
7970  035244  103003                      BCC     .+10            ;IF NO ERROR, PROCEED
7971  035246                              ERROR                   ;ELSE, REPORT IT
7972  035246  104460                                                          TRAP    C$ERROR
7973  035250                              ESCAPE  TST             ;       AND EXIT THIS TEST
7974  035250  104410                                                          TRAP    C$ESCAPE
7975  035252  000604                                                          .WORD   L10073-.
7976  035254  004737  036112              JSR     PC,GETT1        ;IS 'T1' CLEARED NOW
7977  035260  102002                      BVC     16$             ;IF NO ERROR, PROCEED
7978  035262                              ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
7979  035262  104410                                                          TRAP    C$ESCAPE
7980  035264  000570                                                          .WORD   L10075-.
7981  035266  103004      16$:    BCC     29$             ;YES, ALL'S OK
7982  035270                              GEDF    EM50C,ERR50     ;NO!  BAD VIA CHIP!
7983                                                              ;       'DEVICE FATAL'' ERROR # 78
7984  035270  104455                                                          TRAP    C$ERDF
7985  035272  000116                                                          .WORD   78
7986  035274  016203                                                          .WORD   EM50C
7987  035276  010762                                                          .WORD   ERR50
7988
7989                              ;-----------------------------------------------------------------------
7990
7991  035300  105037  002445      29$:    CLRB    TMP2+1          ;CHANGE THE DIRECTION OF ORB -- IT SHOULDN'T
7992  035304  004537  004310              JSR     R5,WRITE        ;   HAVE ANY EFFECT ON 'PB7'
7993  035310  120002                      DDRB
7994  035312  002445                      TMP2+1
7995  035314  103003                      BCC     .+10            ;IF NO ERROR, PROCEED
7996  035316                              ERROR                   ;ELSE, REPORT IT
7997  035316  104460                                                          TRAP    C$ERROR
7998  035320                              ESCAPE  TST             ;       AND EXIT THIS TEST
7999  035320  104410                                                          TRAP    C$ESCAPE
8000  035322  000534                                                          .WORD   L10073-.
8001  035324  004537  004310              JSR     R5,WRITE        ;RE-WRITE INTO T1C-H (ADDR 05) TO SET T1 AGAIN
8002  035330  120005                      T1CH
8003  035332  002453                      TMP5+1
8004  035334  103003                      BCC     .+10            ;IF NO ERROR, PROCEED
8005  035336                              ERROR                   ;ELSE, REPORT IT
8006  035336  104460                                                          TRAP    C$ERROR
8007  035340                              ESCAPE  TST             ;       AND EXIT THIS TEST
```

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8008  035340  104410                                                          TRAP    C$ESCAPE
8009  035342  000514                                                          .WORD   L10073-.
8010  035344  004737  036112          JSR     PC,GETT1        ;IS 'T1' SET AGAIN
8011  035350  102002                  BVC     .+6             ;IF NO ERROR, PROCEED
8012  035352                          ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
8013  035352  104410                                                          TRAP    C$ESCAPE
8014  035354  000500                                                          .WORD   L10075-.
8015  035356  103426                  BCS     32$             ;YES, ALL'S WELL (AGAIN?)
8016  035360  004537  004064          JSR     R5,READ         ;GET T1CH FOR ERROR MESSAGE
8017  035364  120005                  T1CH
8018  035366  002452                  TMP5
8019  035370  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
8020  035372                          ERROR                   ;ELSE, REPORT IT
8021  035372  104460                                                          TRAP    C$ERROR
8022  035374                          ESCAPE  TST             ;       AND EXIT THIS TEST
8023  035374  104410                                                          TRAP    C$ESCAPE
8024  035376  000460                                                          .WORD   L10073-.
8025  035400  004537  004064          JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
8026  035404  120007                  T1LH
8027  035406  002456                  TMP7
8028  035410  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
8029  035412                          ERROR                   ;ELSE, REPORT IT
8030  035412  104460                                                          TRAP    C$ERROR
8031  035414                          ESCAPE  TST             ;       AND EXIT THIS TEST
8032  035414  104410                                                          TRAP    C$ESCAPE
8033  035416  000440                                                          .WORD   L10073-.
8034  035420                          GEDF    EM50L,ERR50     ;NO!  SOMETHING WENT WRONG!  REPORT IT
8035                                                          ;       'DEVICE FATAL" ERROR # 79
8036  035420  104455                                                          TRAP    C$ERDF
8037  035422  000117                                                          .WORD   79
8038  035424  016730                                                          .WORD   EM50L
8039  035426  010762                                                          .WORD   ERR50
8040  035430                          ESCAPE  SUB             ;       AND EXIT FROM THIS SUBTEST
8041  035430  104410                                                          TRAP    C$ESCAPE
8042  035432  000422                                                          .WORD   L10075-.
8043
8044                          ;-------------------------------------------------------------------
8045
8046  035434  004737  036276  32$:    JSR     PC,GETPB7       ;GET 'PB7".  IS IT SET?
8047  035440  102002                  BVC     .+6             ;IF NO ERROR, PROCEED
8048  035442                          ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
8049  035442  104410                                                          TRAP    C$ESCAPE
8050  035444  000410                                                          .WORD   L10075-.
8051  035446  103404                  BCS     44$             ;YES,  GOOD.
8052  035450                          GEDF    EM50U,ERR50     ;NO,  BAD!  REPORT IT:  NU; SET AFTER TIMEOUT
8053                                                          ;       'DEVICE FATAL" ERROR # 80
8054  035450  104455                                                          TRAP    C$ERDF
8055  035452  000120                                                          .WORD   80
8056  035454  017174                                                          .WORD   EM50U
8057  035456  010762                                                          .WORD   ERR50
8058  035460  112737  000125  002455  44$:    MOVB    #125,TMP6+1     ;USING A DIFFERENT VALUE -- 55 HEX.,
8059  035466  004537  004310          JSR     R5,WRITE        ;RE-LOAD T1L-L (ADDR 06)
8060  035472  120006                  T1LL
8061  035474  002455                  TMP6+1
8062  035476  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
8063  035500                          ERROR                   ;ELSE, REPORT IT
```

```
8064  035500  104460                                                          TRAP    C$ERROR
8065  035502
8066  035502  104410                                                          TRAP    C$ESCAPE
8067  035504  000352                                                          .WORD   L10073-.
8068  035506  004737  036112        JSR     PC,GETT1        ;IS 'T1' STILL SET?
8069  035512  102002                BVC     .+6             ;IF NO ERROR, PROCEED
8070  035514                        ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
8071  035514  104410                                                          TRAP    C$ESCAPE
8072  035516  000336                                                          .WORD   L10075-.
8073  035520  103416                BCS     33$             ;YES, ALL'S STILL OK
8074  035522  004537  004064        JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
8075  035526  120006                T1LL
8076  035530  002454                TMP6
8077  035532  103003                BCC     .+10            ;IF NO ERROR, PROCEED
8078  035534                        ERROR                   ;ELSE, REPORT IT
8079  035534  104460                                                          TRAP    C$ERROR
8080  035536                        ESCAPE  TST             ;       AND EXIT THIS TEST
8081  035536  104410                                                          TRAP    C$ESCAPE
8082  035540  000316                                                          .WORD   L10073-.
8083  035542                        GEDF    EM50M,ERR50     ;NO!  SOMETHING WENT WRONG!  REPORT IT
8084                                                        ;       'DEVICE FATAL'' ERROR # 81
8085  035542  104455                                                          TRAP    C$ERDF
8086  035544  000121                                                          .WORD   81
8087  035546  017012                                                          .WORD   EM50M
8088  035550  010762                                                          .WORD   ERR50
8089  035552                        ESCAPE  SUB             ;       AND EXIT FROM THIS SUBTEST
8090  035552  104410                                                          TRAP    C$ESCAPE
8091  035554  000300                                                          .WORD   L10075-.
8092
8093                                ;-----------------------------------------------------------------
8094
8095  035556  112737  000125  002453  33$:   MOVB    #125,TMP5+1     ;AND USING THE SAME VALUE AGAIN (55 HEX),
8096  035564  004537  004310                JSR     R5,WRITE        ;NOW,LOAD T1C-H (ADDR 05)
8097  035570  120005                        T1CH
8098  035572  002453                        TMP5+1
8099  035574  103003                BCC     .+10            ;IF NO ERROR, PROCEED
8100  035576                        ERROR                   ;ELSE, REPORT IT
8101  035576  104460                                                          TRAP    C$ERROR
8102  035600                        ESCAPE  TST             ;       AND EXIT THIS TEST
8103  035600  104410                                                          TRAP    C$ESCAPE
8104  035602  000254                                                          .WORD   L10073-.
8105  035604  004737  036112        JSR     PC,GETT1        ;'T1'' SHOULD NOW BE CLEARED
8106  035610  102002                BVC     .+6             ;IF NO ERROR, PROCEED
8107  035612                        ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
8108  035612  104410                                                          TRAP    C$ESCAPE
8109  035614  000240                                                          .WORD   L10075-.
8110  035616  103024                BCC     34$             ;IT WAS, ALL'S WELL THAT END'S WELL (I THINK!?)
8111  035620  004537  004064        JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
8112  035624  120006                T1LL
8113  035626  002454                TMP6
8114  035630  103003                BCC     .+10            ;IF NO ERROR, PROCEED
8115  035632                        ERROR                   ;ELSE, REPORT IT
8116  035632  104460                                                          TRAP    C$ERROR
8117  035634                        ESCAPE  TST             ;       AND EXIT THIS TEST
8118  035634  104410                                                          TRAP    C$ESCAPE
8119  035636  000220                                                          .WORD   L10073-.
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CVDMAA.P11    12-DEC-80 15:59          TEST 27 -- VIA TIMER # 1 ONE-SHOT MODE

 8120  035640  004537  004064          JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
 8121  035644  120007                  T1LH
 8122  035646  002456                  TMP7
 8123  035650  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
 8124  035652                          ERROR                   ;ELSE, REPORT IT
                                                                        TRAP    C$ERROR
 8125  035652  104460
 8126  035654                          ESCAPE  TST             ;       AND EXIT THIS TEST
                                                                        TRAP    C$ESCAPE
 8127  035654  104410
 8128  035656  000200                                                   .WORD   L10073-.
 8129  035660                          GEDF    EM50N,ERR50     ;IT WASN'T!  SOMETHING WENT WRONG!  REPORT IT
 8130                                                          ;       'DEVICE FATAL'' ERROR # 82
                                                                        TRAP    C$ERDF
 8131  035660  104455
 8132  035662  000122                                                   .WORD   82
 8133  035664  017054                                                   .WORD   EM50N
 8134  035666  010762                                                   .WORD   ERR50
 8135
 8136  035670  004537  004310  34$:    JSR     R5,WRITE        ;RE-LOAD T1C-H (ADDR 5) TO START IT AGAIN
 8137  035674  120005                  T1CH
 8138  035676  002453                  TMP5+1
 8139  035700  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
 8140  035702                          ERROR                   ;ELSE, REPORT IT
                                                                        TRAP    C$ERROR
 8141  035702  104460
 8142  035704                          ESCAPE  TST             ;       AND EXIT THIS TEST
                                                                        TRAP    C$ESCAPE
 8143  035704  104410
 8144  035706  000150                                                   .WORD   L10073-.
 8145  035710  004737  036276          JSR     PC,GETPB7       ;GET 'PB7'.  IS IT CLEARED?
 8146  035714  102002                  BVC     .+6             ;IF NO ERROR, PROCEED
 8147  035716                          ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
                                                                        TRAP    C$ESCAPE
 8148  035716  104410
 8149  035720  000134                                                   .WORD   L10075-.
 8150  035722  103054                  BCC     48$             ;YES, GOOD.
 8151  035724  004537  004064          JSR     R5,READ         ;GET IFR FOR ERROR MESSAGE
 8152  035730  120015                  IFR
 8153  035732  002472                  TMPD
 8154  035734  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
 8155  035736                          ERROR                   ;ELSE, REPORT IT
                                                                        TRAP    C$ERROR
 8156  035736  104460
 8157  035740                          ESCAPE  TST             ;       AND EXIT THIS TEST
                                                                        TRAP    C$ESCAPE
 8158  035740  104410
 8159  035742  000114                                                   .WORD   L10073-.
 8160  035744  004537  004064          JSR     R5,READ         ;GET T1CL FOR ERROR MESSAGE
 8161  035750  120004                  T1CL
 8162  035752  002450                  TMP4
 8163  035754  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
 8164  035756                          ERROR                   ;ELSE, REPORT IT
                                                                        TRAP    C$ERROR
 8165  035756  104460
 8166  035760                          ESCAPE  TST             ;       AND EXIT THIS TEST
                                                                        TRAP    C$ESCAPE
 8167  035760  104410
 8168  035762  000074                                                   .WORD   L10073-.
 8169  035764  004537  004064          JSR     R5,READ         ;GET T1CH FOR ERROR MESSAGE
 8170  035770  120005                  T1CH
 8171  035772  002452                  TMP5
 8172  035774  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
 8173  035776                          ERROR                   ;ELSE, REPORT IT
                                                                        TRAP    C$ERROR
 8174  035776  104460
 8175  036000                          ESCAPE  TST             ;       AND EXIT THIS TEST
```

```
8176  036000  104410                                                          TRAP    C$ESCAPE
8177  036002  000054                                                          .WORD   L10073-.
8178  036004  004537  004064          JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
8179  036010  120006                  T1LL
8180  036012  002454                  TMP6
8181  036014  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
8182  036016                          ERROR                   ;ELSE, REPORT IT
8183  036016  104460                                                          TRAP    C$ERROR
8184  036020                          ESCAPE  TST             ;       AND EXIT THIS TEST
8185  036020  104410                                                          TRAP    C$ESCAPE
8186  036022  000034                                                          .WORD   L10073-.
8187  036024  004537  004064          JSR     R5,READ         ;GET T1LH FOR ERROR MESSAGE
8188  036030  120007                  T1LH
8189  036032  002456                  TMP7
8190  036034  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
8191  036036                          ERROR                   ;ELSE, REPORT IT
8192  036036  104460                                                          TRAP    C$ERROR
8193  036040                          ESCAPE  TST             ;       AND EXIT THIS TEST
8194  036040  104410                                                          TRAP    C$ESCAPE
8195  036042  000014                                                          .WORD   L10073-.
8196  036044                          GEDF    EM50V,ERR50     ;NO,  BAD!  RPT. PB7 NOT DRIVEN LOW
8197                                                          ;       'DEVICE FATAL'' ERROR # 83
8198  036044  104455                                                          TRAP    C$ERDF
8199  036046  000123                                                          .WORD   83
8200  036050  017240                                                          .WORD   EM50V
8201  036052  010762                                                          .WORD   ERR50
8202  036054                  48$:    ENDSUB
8203  036054                                                          L10075:
8204  036054  104403                                                          TRAP    C$ESUB
8205  036056                          ENDTST
8206  036056                                                          L10073:
8207  036056  104401                                                          TRAP    C$ETST
8208
8209                          ;-----------------------------------------------------------------------
8210                          ; LODT1C -- LOAD TIMER ONE AT ADDRESSES 04 & 05
8211                          ;
8212                          ; CALLING SEQUENCE:
8213                          ;
8214                          ;       JSR     R5,LODT1C
8215                          ;       .BYTE   <VALUE FOR T1L-L (ADDRESS 04)>
8216                          ;       .BYTE   <VALUE FOR T1C-H (ADDRESS 05)>
8217                          ;       <NEXT SEQUENCIAL INSTRUCTION
8218                          ;
8219                          ;-----------------------------------------------------------------------
8220
8221  036060  112537  002451  LODT1C: MOVB    (R5)+,TMP4+1    ;SETUP TO LOAD T1CL
8222  036064  112537  002453          MOVB    (R5)+,TMP5+1    ;  AND T1CH
8223  036070  004537  004310          JSR     R5,WRITE        ;LOAD T1C-L (ADDR 04) WITH PASSED PARAMETER
8224  036074  120004                  T1CL
8225  036076  002451                  TMP4+1
8226  036100  004537  004310          JSR     R5,WRITE        ;LOAD T1C-H (ADDR 05) WITH PASSED PARAMETER
8227  036104  120005                  T1CH                    ;  (THIS WILL ALSO RESET 'T1'' & THE COUNTER)
8228  036106  002453                  TMP5+1
8229  036110  000205                  RTS     R5
8230
8231                          ;-----------------------------------------------------------------------
```

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

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

036112  004537  004064  GETT1:  JSR     R5,READ         ;GET VIA'S IFR REG.
036116  120015                  IFR
036120  002472                  TMPD
036122  103003          BCC     1$              ;IF NO ERROR, PROCEED
036124                  ERROR                   ;ELSE, REPORT IT
                                                                TRAP    C$ERROR
036124  104460
036126  000262          SEV                     ;FLAG AN ERROR TO MAINLINE ROUTINE
036130  000207          RTS     PC              ;  AND TAKE AN ABNORMAL RETURN

036132  010046          1$:     MOV     R0,-(SP)        ;PRESERVE R0
036134  113700  002472          MOVB    TMPD,R0         ;PUT VALUE HERE TO PRESERVE TMPD
036140  106100                  ROLB    R0              ;"IRQ" GOES INTO CARRY BIT
036142  106100                  ROLB    R0              ;"T1" GOES INTO CARRY BIT
036144  012600                  MOV     (SP)+,R0        ;RESTORE R0
036146  000207                  RTS     PC

                        ;-----------------------------------------------------------------
                        ; KICKT1 -- INIT. TIMER # 1 BY THE FOLLOWING PROCEDURE:
                        ;
                        ;       READ T1L-H (ADDR 07) TO GET THE LAST VALUE LOADED INTO IT
                        ;
                        ;       WRITE THAT VALUE INTO T1C-H (ADDR 05) TO RESET THE 'T1' INTERRUPT FLAG
                        ;          AND CAUSE THE RE-LOADING OF BOTH COUNTERS.
                        ;
                        ;-----------------------------------------------------------------

036150  010346          KICKT1: MOV     R3,-(SP)        ;SAVE CALLER'S REGISTER CONTENTS
036152  004537  004064          JSR     R5,READ         ;GET THE CURRENT SETTING OF THE HIGH LATCH
036156  120007                  T1LH
036160  002456                  TMP7
036162  103443                  BCS     10$             ;IF ERROR, EXIT

036164  012777  120005  144170          MOV     #T1CH,@SEL4     ;SETUP ADDRESS FOR M-LOOP WRITE
036172  113777  002456  144166          MOVB    TMP7,@SEL6      ;SETUP DATA FOR SAME
036200  113737  002456  002453          MOVB    TMP7,TMP5+1     ;PUT HERE TOO. BECAUSE WE'RE GOING TO WRITE IT.
036206  142777  000100  144144          BICB    #IFRT1,@SEL3    ;CLEAR THE INTERRUPT BIT -- JUST IN CASE
036214  112777  000002  144134          MOVB    #WRILOC,@SEL2   ;TELL THE M-LOOP TO WRITE THE BYTE FOR US
036222  012703  000074                  MOV     #60.,R3         ;SETUP TIMEOUT COUNTER
036226  132777  000200  144122  5$:     BITB    #MRDY,@SEL2     ;WAIT FOR M-READY TO BE SET
036234  001016                  BNE     10$             ;AS SOON AS 'MRDY' IS SET, EXIT'
036236  077305                  SOB     R3,5$           ;IF NO TIMEOUT, CHECK AGAIN FOR M-READY
036240                  GTDF    EM4,ERR4        ;ELSE, 'MRDY' TIMEOUT
                                                ;       QUEUE 'DEVICE FATAL' ERROR # 84
036240  012737  000001  002236                                  MOV     #T.EDF,ERRTYP
036246  012737  000124  002240                                  MOV     #84,ERRNBR
036254  012737  014500  002242                                  MOV     #EM4,ERRMSG
036262  012737  005426  002244                                  MOV     #ERR4,ERRBLK
036270  000261                  SEC                     ;INDICATE THE FAILURE & EXIT

036272  012603          10$:    MOV     (SP)+,R3        ;RESTORE REGISTER
```

```
8288  036274  000207                  RTS     PC              ;IMMEDIATE RETURN
8289
8290
8291                                  ;-----------------------------------------------------------------------
8292                                  ; GETPB7 -- PUT THE CURRENT SETTING OF 'PB7' (BIT 7 OF ORB W/IN THE VIA CHIP)
8293                                  ;           INTO THE CARRY BIT SO IT CAN BE TESTED UPON RETURN.
8294                                  ;
8295                                  ;       CALLING SEQUENCE:
8296                                  ;
8297                                  ;       JSR     PC,GETPB7
8298                                  ;       <TEST FOR PB7 SET OR CLEARED WITH 'BCS' OR 'BCC' INSTR'S>
8299                                  ;
8300                                  ;-----------------------------------------------------------------------
8301  036276  004537  004064  GETPB7: JSR     R5,READ         ;GET THE REGISTER THAT CONTAINS 'PB7'
8302  036302  120000                  ORB
8303  036304  002440                  TMP0
8304  036306  103003                  BCC     1$              ;IF NO ERROR, PROCEED
8305  036310                          ERROR                   ;ELSE, REPORT IT
8306  036310  104460                                                  TRAP    C$ERROR
8307  036312  000262                  SEV                     ;FLAG AN ERROR TO MAINLINE ROUTINE
8308  036314  000207                  RTS     PC              ;  AND TAKE AN ABNORMAL RETURN
8309
8310  036316  010046          1$:     MOV     R0,-(SP)        ;PRESERVE THIS REGISTER FOR THE CALLER
8311  036320  113700  002440          MOVB    TMP0,R0         ;PUT ITS CONTENTS HERE SO WE CAN MANIPULATE IT
8312  036324  106100                  ROLB    R0              ;PUT 'PB7' INTO THE CARRY BIT
8313  036326  012600                  MOV     (SP)+,R0        ;RESTORE R0 FOR THE CALLER
8314  036330  000207                  RTS     PC              ;RETURN WITH 'PB7' IN THE CARRY BIT
8315
```

```
                                .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
036332                                                            T28::
036332                                  BGNSUB
036332                                                            T28.1:
036332  104402                                                        TRAP    C$B
036334  004737  003762                  JSR     PC,MSTCLR       ;INIT DMV & ENTER M-LOOP
036340  103003                          BCC     1$              ;IF NO ERROR, PROCEED WITH TESTING
```

```
8372  036342
8373  036342  104460                        ERROR                   ;ELSE, REPORT ERROR
                                                                      TRAP    C$ERROR
8374  036344                                ESCAPE  TST             ;   & EXIT TEST
8375  036344  104410                                                 TRAP    C$ESCAPE
8376  036346  001514                                                 .WORD   L10076-.
8377  036350  004537  004660    1$:         JSR     R5,INITT1       ;INITIALIZE TIMER # 1
8378  036354  000000                        0                       ;       0 ==> LATCHES
8379  036356  000100                        BIT6                    ;       MODE 1 & 'T1' INT. ENABLE FLAG CLEARED
8380  036360  103003                        BCC     .+10            ;IF NO ERROR, PROCEED
8381  036362                                ERROR                   ;ELSE, REPORT IT
8382  036362  104460                                                 TRAP    C$ERROR
8383  036364                                ESCAPE  TST             ;       AND EXIT THIS TEST
8384  036364  104410                                                 TRAP    C$ESCAPE
8385  036366  001474                                                 .WORD   L10076-.
8386  036370  004737  036112              JSR     PC,GETT1        ;IS 'T1' SET?
8387  036374  102002                        BVC     .+6             ;IF NO ERROR, PROCEED
8388  036376                                ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
8389  036376  104410                                                 TRAP    C$ESCAPE
8390  036400  000414                                                 .WORD   L10077-.
8391  036402  103006                        BCC     2$              ;NO, GOOD.
8392  036404                                GEDF    EM50A,ERR50     ;YES, REPORT IT'S NOT BEING CLEARED @ INIT.
8393                                                                ;       'DEVICE FATAL' ERROR # 85
8394  036404  104455                                                 TRAP    C$ERDF
8395  036406  000125                                                 .WORD   8
8396  036410  016067                                                 .WORD   EM50A
8397  036412  010762                                                 .WORD   ERR50
8398  036414                                ESCAPE  SUB             ;   & EXIT TEST
8399  036414  104410                                                 TRAP    C$ESCAPE
8400  036416  000376                                                 .WORD   L10077-.
8401
8402                                        ;-------------------------------------------------------------------------
8403
8404  036420  004537  036060    2$:         JSR     R5,LODT1C       ;RELOAD TIMER 1'S COUNTERS WITH NEW VALUES:
8405  036424     125     125                .BYTE   125,125
8406
8407                                        ;-------------------------------------------------------------------------
8408
8409  036426  005003                        CLR     R3              ;INITIALIZE TIMEOUT COUNTER
8410  036430  004737  036112    3$:         JSR     PC,GETT1        ;'T1' SHOULD BE SET.  IS IT?
8411  036434  102002                        BVC     .+6             ;IF NO ERROR, PROCEED
8412  036436                                ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
8413  036436  104410                                                 TRAP    C$ESCAPE
8414  036440  000354                                                 .WORD   L10077-.
8415  036442  103407                        BCS     4$              ;YES, GOOD.
8416  036444  077307                        SOB     R3,3$           ;NO,  IF NO TIMEOUT, LOOK AGAIN
8417  036446                                GEDF    EM50F,ERR50     ;ELSE, SAY IT WASN'T SET BY T1 TIMEOUT
8418                                                                ;       'DEVICE FATAL' ERROR # 86
8419  036446  104455                                                 TRAP    C$ERDF
8420  036450  000126                                                 .WORD   86
8421  036452  016341                                                 .WORD   EM50F
8422  036454  010762                                                 .WORD   ERR50
8423  036456                                ESCAPE  SUB             ;IF ERROR, THE REST OF THIS TEST IS UN-DOABLE!
8424  036456  104410                                                 TRAP    C$ESCAPE
8425  036460  000334                                                 .WORD   L10077-.
8426
8427  036462  004537  004064    4$:         JSR     R5,READ         ;READING T1CH SHOULDN'T CLEAR 'T1'
```

```
8428  036466  120005                  T1CH
8429  036470  002452                  TMP5                    ; (WE DON'T CARE WHAT THIS IS)
8430  036472  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
8431  036474                          ERROR                   ;ELSE, REPORT IT
8432  036474  104460                                                          TRAP    C$ERROR
8433  036476                          ESCAPE  TST             ;       AND EXIT THIS TEST
8434  036476  104410                                                          TRAP    C$ESCAPE
8435  036500  001362                                                          .WORD   L10076-.
8436  036502  004737  036112          JSR     PC,GETT1        ;CHECK 'T1'' -- IT SHOULD STILL BE SET
8437  036506  102002                  BVC     .+6             ;IF NO ERROR, PROCEED
8438  036510                          ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
8439  036510  104410                                                          TRAP    C$ESCAPE
8440  036512  000302                                                          .WORD   L10077-.
8441  036514  103404                  BCS     6$              ;IT IS, GOOD.
8442  036516                          GEDF    EM50G,ERR50     ;CLEARED BY READING T1CH!!
8443                                                          ;       'DEVICE FATAL'' ERROR # 87
8444  036516  104455                                                          TRAP    C$ERDF
8445  036520  000127                                                          .WORD   87
8446  036522  016406                                                          .WORD   EM50G
8447  036524  010762                                                          .WORD   ERR50
8448  036526  004737  036150  6$:     JSR     PC,KICKT1       ;KICK IT OFF AGAIN SO WE CAN PRESERVE TIMING
8449  036532  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
8450  036534                          ERROR                   ;ELSE, REPORT IT
8451  036534  104460                                                          TRAP    C$ERROR
8452  036536                          ESCAPE  TST             ;       AND EXIT THIS TEST
8453  036536  104410                                                          TRAP    C$ESCAPE
8454  036540  001322                                                          .WORD   L10076-.
8455
8456                                                  ;WAIT FOR IT TO FINISH:
8457  036542  005003                  CLR     R3              ;INITIALIZE TIMEOUT COUNTER
8458  036544  004737  036112  7$:     JSR     PC,GETT1        ;'T1'' SHOULD BE SET.  IS IT?
8459  036550  102002                  BVC     .+6             ;IF NO ERROR, PROCEED
8460  036552                          ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
8461  036552  104410                                                          TRAP    C$ESCAPE
8462  036554  000240                                                          .WORD   L10077-.
8463  036556  103402                  BCS     8$              ;YES, GOOD.
8464  036560  077307                  SOB     R3,7$           ;NO,  IF NO TIMEOUT, LOOK AGAIN
8465  036562  000422                  BR      10$             ;IF TIMEOUT, BYPASS NEXT CHECK (THIS DONE ABOVE)
8466  036564  004537  004064  8$:     JSR     R5,READ         ;READING T1CL SHOULD CLEAR 'T1''
8467  036570  120004                  T1CL
8468  036572  002450                  TMP4                    ; (WE DON'T CARE WHAT THIS IS EITHER)
8469  036574  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
8470  036576                          ERROR                   ;ELSE, REPORT IT
8471  036576  104460                                                          TRAP    C$ERROR
8472  036600                          ESCAPE  TST             ;       AND EXIT THIS TEST
8473  036600  104410                                                          TRAP    C$ESCAPE
8474  036602  001260                                                          .WORD   L10076-.
8475  036604  004737  036112          JSR     PC,GETT1        ;CHECK 'T1'' -- IT SHOULD BE CLEARED NOW
8476  036610  102002                  BVC     .+6             ;IF NO ERROR, PROCEED
8477  036612                          ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
8478  036612  104410                                                          TRAP    C$ESCAPE
8479  036614  000200                                                          .WORD   L10077-.
8480  036616  103004                  BCC     10$             ;IT IS, GOOD.
8481  036620                          GEDF    EM50C,ERR50     ;NOT CLEARED!  REPORT IT.
8482                                                          ;       'DEVICE FATAL'' ERROR # 88
8483  036620  104455                                                          TRAP    C$ERDF
```

```
8464  036622  000130                                                          .WORD   88
8485  036624  016203                                                          .WORD   EM50C
8486  036626  010762                                                          .WORD   ERR50
8487  036630  005003          10$:    CLR     R3              ;RE-INITIALIZE THE TIMEOUT COUNTER
8488  036632  004737  036112  12$:    JSR     PC,GETT1        ;WAIT FOR 'T1' TO GET SET AGAIN
8489  036636  102002                  BVC     .+6             ;IF NO ERROR, PROCEED
8490  036640                          ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
8491  036640  104410                                                          TRAP    C$ESCAPE
8492  036642  000152                                                          .WORD   L10077-.
8493  036644  103407                  BCS     14$             ;GOT IT -- GOOD.
8494  036646  077307                  SOB     R3,12$          ;NOT YET.  IF NO TIMEOUT, TRY AGAIN.
8495  036650                          GEDF    EM50X,ERR50     ;ELSE, REPORT 'T1' NOT RESET
8496                                                          ;       'DEVICE FATAL' ERROR # 89
8497  036650  104455                                                          TRAP    C$ERDF
8498  036652  000131                                                          .WORD   89
8499  036654  017354                                                          .WORD   EM50X
8500  036656  010762                                                          .WORD   ERR50
8501  036660                          ESCAPE  SUB             ;IF ERROR, CAN'T CONTINUE THIS TEST
8502  036660  104410                                                          TRAP    C$ESCAPE
8503  036662  000132                                                          .WORD   L10077-.
8504  036664  112737  000252  002455  14$:    MOVB    #252,TMP6+1     ;SETUP FOR AND
8505  036672  004537  004310          JSR     R5,WRITE        ;  LOAD T1LL (ADDR 6)
8506  036676  120006                  T1LL
8507  036700  002455                  TMP6+1                  ;  WITH 252 OCTAL
8508  036702  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
8509  036704                          ERROR                   ;ELSE, REPORT IT
8510  036704  104460                                                          TRAP    C$ERROR
8511  036706                          ESCAPE  TST             ;       AND EXIT THIS TEST
8512  036706  104410                                                          TRAP    C$ESCAPE
8513  036710  001152                                                          .WORD   L10076-.
8514  036712  004737  036112          JSR     PC,GETT1        ;THIS SHOULDN'T CLEAR 'T1'
8515  036716  102002                  BVC     .+6             ;IF NO ERROR, PROCEED
8516  036720                          ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
8517  036720  104410                                                          TRAP    C$ESCAPE
8518  036722  000072                                                          .WORD   L10077-.
8519  036724  103406                  BCS     16$             ;IT DIDN'T -- GOOD.
8520  036726                          GEDF    EM50M,ERR50     ;WOOPS, IT DID!!  REPORT FAILURE
8521                                                          ;       'DEVICE FATAL' ERROR # 90
8522  036726  104455                                                          TRAP    C$ERDF
8523  036730  000132                                                          .WORD   90
8524  036732  017012                                                          .WORD   EM50M
8525  036734  010762                                                          .WORD   ERR50
8526  036736                          ESCAPE  SUB             ;       THE REST OF THIS TEST IS INVALID TOO!
8527  036736  104410                                                          TRAP    C$ESCAPE
8528  036740  000054                                                          .WORD   L10077-.
8529  036742  112737  000252  002457  16$:    MOVB    #252,TMP7+1     ;SETUP FOR AND
8530  036750  004537  004310          JSR     R5,WRITE        ;  LOAD T1LH (ADDR 7)
8531  036754  120007                  T1LH
8532  036756  002457                  TMP7+1                  ;  WITH 252 OCTAL
8533  036760  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
8534  036762                          ERROR                   ;ELSE, REPORT IT
8535  036762  104460                                                          TRAP    C$ERROR
8536  036764                          ESCAPE  TST             ;       AND EXIT THIS TEST
8537  036764  104410                                                          TRAP    C$ESCAPE
8538  036766  001074                                                          .WORD   L10076-.
8539  036770  004737  036112          JSR     PC,GETT1        ;THIS SHOULD CLEAR 'T1'
```

```
8540  036774  102002                  BVC     .+6             ;IF NO ERROR, PROCEED
8541  036776                          ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
8542  036776  104410                                                          TRAP    C$ESCAPE
8543  037000  000014                                                          .WORD   L10077-.
8544  037002  103004                  BCC     18$             ;IT DID -- GOOD.
8545  037004                          GEDF    EM50A,ERR50     ;NOP!  REPORT:  "T1" NOT CLEARED BY LOADING T1LH
8546                                                          ;       "DEVICE FATAL" ERROR # 91
8547  037004  104455                                                          TRAP    C$ERDF
8548  037006  000133                                                          .WORD   91
8549  037010  016067                                                          .WORD   EM50A
8550  037012  010762                                                          .WORD   ERR50
8551  037014                  18$:    ;THAT'S ALL FOLKS!
8552  037014                          ENDSUB
8553  037014                                                          L10077:
8554  037014  104403                                                          TRAP    C$ESUB
8555                          ;=======================================================================
8556  037016                          BGNSUB
8557  037016                                                          T28.2:
8558  037016  104402                                                          TRAP    C$BSUB
8559  037020  004737  003762          JSR     PC,MSTCLR       ;INIT DMV & ENTER M-LOOP
8560  037024  103003                  BCC     1$              ;IF NO ERROR, PROCEED WITH TESTING
8561  037026                          ERROR                   ;ELSE, REPORT ERROR
8562  037026  104460                                                          TRAP    C$ERROR
8563  037030                          ESCAPE  TST             ;   & EXIT TEST
8564  037030  104410                                                          TRAP    C$ESCAPE
8565  037032  001030                                                          .WORD   L10076-.
8566  037034  112737  000377  002445  1$:     MOVB    #377,TMP2+1     ;SETUP DDRB SUCH THAT ORB IS AN INPUT/OUTPUT REG
8567  037042  004537  004310          JSR     R5,WRITE
8568  037046  120002                  DDRB
8569  037050  002445                  TMP2+1
8570  037052  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
8571  037054                          ERROR                   ;ELSE, REPORT IT
8572  037054  104460                                                          TRAP    C$ERROR
8573  037056                          ESCAPE  TST             ;       AND EXIT THIS TEST
8574  037056  104410                                                          TRAP    C$ESCAPE
8575  037060  001002                                                          .WORD   L10076-.
8576  037062  112737  000030  002441  MOVB    #30,TMP0+1      ;CLEAR ALL BITS IN ORB EXCEPT DTR L & RTS L
8577  037070  004537  004310          JSR     R5,WRITE        ;  BY DOING THIS, WE SHOULD EXPECT PB7 TO BE
8578  037074  120000                  ORB                     ;  CLEARED IF MODE 3 DOESN'T WORK PROPERLY.
8579  037076  002441                  TMP0+1
8580  037100  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
8581  037102                          ERROR                   ;ELSE, REPORT IT
8582  037102  104460                                                          TRAP    C$ERROR
8583  037104                          ESCAPE  TST             .       AND EXIT THIS TEST
8584  037104  104410                                                          TRAP    C$ESCAPE
8585  037106  000754                                                          .WORD   L10076-.
8586  037110  004537  004660          JSR     R5,INITT1       ;INITIALIZE TIMER # 1
8587  037114  000000                  0                       ;       0 ==> LATCHES
8588  037116  000300                  BIT7+BIT6               ;       MODE 3 & "T1" INT. ENABLE FLAG CLEARED
8589  037120  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
8590  037122                          ERROR                   ;ELSE, REPORT IT
8591  037122  104460                                                          TRAP    C$ERROR
8592  037124                          ESCAPE  TST             ;       AND EXIT THIS TEST
8593  037124  104410                                                          TRAP    C$ESCAPE
8594  037126  000734                                                          .WORD   L10076-.
8595  037130  004737  036112          JSR     PC,GETT1        ;IS "T1" SET?
```

```
8595  037134  102002                  BVC     .+6             ;IF NO ERROR, PROCEED
8597  037136                          ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
8598  037136  104410                                                          TRAP    C$ESCAPE
8599  037140  000720                                                          .WORD   L10100-.
8600  037142  103006                  BCC     2$              ;NO, GOOD.
8601  037144                          GEDF    EM50A,ERR50     ;YES, REPORT IT'S NOT BEING CLEARED @ INIT.
8602                                                          ;       'DEVICE FATAL'' ERROR # 92
8603  037144  104455                                                          TRAP    C$ERDF
8604  037146  000134                                                          .WORD   92
8605  037150  016067                                                          .WORD   EM50A
8606  037152  010762                                                          .WORD   ERR50
8607  037154                          ESCAPE  SUB             ;   & EXIT TEST
8608  037154  104410                                                          TRAP    C$ESCAPE
8609  037156  000702                                                          .WORD   L10100-.
8610
8611                                  ;-------------------------------------------------------------------
8612
8613  037160  004537  036060        2$:     JSR     R5,LODT1C       ;RELOAD TIMER 1'S COUNTERS WITH NEW VALUES:
8614  037164     125     125                .BYTE   125,125
8615
8616                                  ;-------------------------------------------------------------------
8617
8618  037166  005003                          CLR     R3              ;INITIALIZE TIMEOUT COUNTER
8619  037170  004737  036112        4$:     JSR     PC,GETT1        ;'T1'' SHOULD BE SET.  IS IT?
8620  037174  102002                  BVC     .+6             ;IF NO ERROR, PROCEED
8621  037176                          ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
8622  037176  104410                                                          TRAP    C$ESCAPE
8623  037200  000660                                                          .WORD   L10100-.
8624  037202  103407                  BCS     5$              ;YES, GOOD.
8625  037204  077307                  SOB     R3,4$           ;NO,  IF NO TIMEOUT, LOOK AGAIN
8626  037206                          GEDF    EM50F,ERR50     ;ELSE, SAY IT WASN'T SET BY T1 TIMEOUT
8627                                                          ;       'DEVICE FATAL'' ERROR # 93
8628  037206  104455                                                          TRAP    C$ERDF
8629  037210  000135                                                          .WORD   93
8630  037212  016341                                                          .WORD   EM50F
8631  037214  010762                                                          .WORD   ERR50
8632  037216                          ESCAPE  SUB             ;IF ERROR, THE REST OF THIS TEST IS UN-DOABLE!
8633  037216  104410                                                          TRAP    C$ESCAPE
8634  037220  000640                                                          .WORD   L10100-.
8635
8636                                  ;-------------------------------------------------------------------
8637
8638  037222                        5$:
8639  037222  004737  036276                  JSR     PC,GETPB7       ;GET 'PB7''.  IS IT SET?
8640  037226  102002                  BVC     .+6             ;IF NO ERROR, PROCEED
8641  037230                          ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
8642  037230  104410                                                          TRAP    C$ESCAPE
8643  037232  000626                                                          .WORD   L10100-.
8644  037234  103406                  BCS     36$             ;YES, GOOD.
8645  037236                          GEDF    EM50U,ERR50     ;NO,  REPORT IT NOT SET.
8646                                                          ;       'DEVICE FATAL'' ERROR # 94
8647  037236  104455                                                          TRAP    C$ERDF
8648  037240  000136                                                          .WORD   94
8649  037242  017174                                                          .WORD   EM50U
8650  037244  010762                                                          .WORD   ERR50
8651  037246                          ESCAPE  SUB             ;       & ALLOW RESTART OF THIS SUBTEST
```

```
                                                                        TRAP    C$ESCAPE
                                                                        .WORD   L10100-.

;-------------------------------------------------------------------------------

36$:    JSR     R5,READ         ;READING T1CH SHOULDN'T CLEAR 'T1'
        T1CH
        TMP5                    ; (WE DON'T CARE WHAT THIS IS)
        BCC     .+10            ;IF NO ERROR, PROCEED
        ERROR                   ;ELSE, REPORT IT
                                                                        TRAP    C$ERROR
        ESCAPE  TST             ;       AND EXIT THIS TEST
                                                                        TRAP    C$ESCAPE
                                                                        .WORD   L10076-.
        JSR     PC,GETT1        ;CHECK 'T1' -- IT SHOULD STILL BE SET
        BVC     .+6             ;IF NO ERROR, PROCEED
        ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
                                                                        TRAP    C$ESCAPE
                                                                        .WORD   L10100-.
        BCS     37$             ;IT IS, GOOD.
        GEDF    EM50G,ERR50     ;CLEARED BY READING T1CH!!
                                ;       'DEVICE FATAL" ERROR # 95
                                                                        TRAP    C$ERDF
                                                                        .WORD   95
                                                                        .WORD   EM50G
                                                                        .WORD   ERR50
        ESCAPE  SUB             ;       ALLOW RESTART OF THIS SUBTEST
                                                                        TRAP    C$ESCAPE
                                                                        .WORD   L10100-.

;-------------------------------------------------------------------------------

37$:    CLR     R3              ;INITIALIZE TIMEOUT COUNTER AGAIN
38$:    JSR     PC,GETT1        ;WAIT FOR 'T1" TO BE SET AGAIN
        BVC     .+6             ;IF NO ERROR, PROCEED
        ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
                                                                        TRAP    C$ESCAPE
                                                                        .WORD   L10100-.
        BCS     39$             ;GOT IT -- NO CHECK PB7
        SOB     R3,38$          ;NOT YET.  IF NO TIMEOUT, LOOK AGAIN.
        GEDF    EM50L,ERR50     ;ELSE, TIMER NOT REALLY WORKING RIGHT:
                                ;       'DEVICE FATAL" ERROR # 96
                                                                        TRAP    C$ERDF
                                                                        .WORD   96
                                                                        .WORD   EM50L
                                                                        .WORD   ERR50
        ESCAPE  SUB
                                                                        TRAP    C$ESCAPE
                                                                        .WORD   L10100-.

;-------------------------------------------------------------------------------

39$:
        JSR     PC,GETPB7       ;GET 'PB7".  IS IT SET?
        BVC     .+6             ;IF NO ERROR, PROCEED
        ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
```

```
                                                                        TRAP    C$ESCAPE
                                                                        .WORD   L10100-.
                BCS     6$                      ;YES, GOOD.
                GEDF    EM50Z,ERR50             ;NO,  REPORT 'PB7'' NOT SET AFTER SECOND CYCLE
                                                ;       'DEVICE FATAL'' ERROR # 97
                                                                        TRAP    C$ERDF
                                                                        .WORD   97
                                                                        .WORD   EM50Z
                                                                        .WORD   ERR50

;-------------------------------------------------------------------------------

6$:     JSR     PC,KICKT1               ;KICK IT OFF AGAIN SO WE CAN PRESERVE TIMING
        BCC     .+10                    ;IF NO ERROR, PROCEED
        ERROR                           ;ELSE, REPORT IT
                                                                        TRAP    C$ERROR
        ESCAPE  TST                     ;       AND EXIT THIS TEST
                                                                        TRAP    C$ESCAPE
                                                                        .WORD   L10076-.

                                ;WAIT FOR IT TO FINISH:
        CLR     R3                      ;INITIALIZE TIMEOUT COUNTER
7$:     JSR     PC,GETT1                ;'T1'' SHOULD BE SET.  IS IT?
        BVC     .+6                     ;IF NO ERROR, PROCEED
        ESCAPE  SUB                     ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
                                                                        TRAP    C$ESCAPE
                                                                        .WORD   L10100-.
        BCS     8$                      ;YES, GOOD.
        SOB     R3,7$                   ;NO,  IF NO TIMEOUT, LOOK AGAIN
        BR      14$                     ;IF TIMEOUT, BYPASS NEXT CHECK (THIS DONE ABOVE)
8$:     JSR     R5,READ                 ;READING T1CL SHOULD CLEAR 'T1''
        T1CL
        TMP4                            ; (WE DON'T CARE WHAT THIS IS EITHER)
        BCC     .+10                    ;IF NO ERROR, PROCEED
        ERROR                           ;ELSE, REPORT IT
                                                                        TRAP    C$ERROR
        ESCAPE  TST                     ;       AND EXIT THIS TEST
                                                                        TRAP    C$ESCAPE
                                                                        .WORD   L10076-.
        JSR     PC,GETT1                ;CHECK 'T1'' -- IT SHOULD BE CLEARED NOW
        BVC     .+6                     ;IF NO ERROR, PROCEED
        ESCAPE  SUB                     ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
                                                                        TRAP    C$ESCAPE
                                                                        .WORD   L10100-.
        BCC     9$                      ;IT IS, GOOD.
        GEDF    EM50C,ERR50             ;NOT CLEARED!  REPORT IT.
                                                ;       'DEVICE FATAL'' ERROR # 98
                                                                        TRAP    C$ERDF
                                                                        .WORD   98
                                                                        .WORD   EM50C
                                                                        .WORD   ERR50
        ESCAPE  SUB                     ;IF THIS ERROR OCCURED, EXIT SUBTEST
                                                                        TRAP    C$ESCAPE
                                                                        .WORD   L10100-.
9$:     CLR     R3                      ;RE-INITIALIZE THE TIMEOUT COUNTER
12$:    JSR     PC,GETT1                ;WAIT FOR 'T1'' TO GET SET AGAIN
```

```
8764  037516  102002                        BVC     .+6             ;IF NO ERROR, PROCEED
8765  037520                                ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
8766  037520  104410                                                        TRAP    C$ESCAPE
8767  037522  000336                                                        .WORD   L10100-.
8768  037524  103407                        BCS     14$             ;GOT IT -- GOOD.
8769  037526  077307                        SOB     R3,12$          ;NOT YET.  IF NO TIMEOUT, TRY AGAIN.
8770  037530                                GEDF    EM50X,ERR50     ;ELSE, REPORT 'T1'' NOT RESET
8771                                                                ;       'DEVICE FATAL'' ERROR # 99
8772  037530  104455                                                        TRAP    C$ERDF
8773  037532  000143                                                        .WORD   99
8774  037534  017354                                                        .WORD   EM50X
8775  037536  010762                                                        .WORD   ERR50
8776  037540                                ESCAPE  SUB             ;IF ERROR, CAN'T CONTINUE THIS TEST
8777  037540  104410                                                        TRAP    C$ESCAPE
8778  037542  000316                                                        .WORD   L10100-.
8779  037544  112737  000252  002455  14$:  MOVB    #252,TMP6+1     ;SETUP FOR AND
8780  037552  004537  004310                JSR     R5,WRITE        ;  LOAD T1LL (ADDR 6)
8781  037556  120006                        T1LL
8782  037560  002455                        TMP6+1                  ;  WITH 252 OCTAL
8783  037562  103003                        BCC     .+10            ;IF NO ERROR, PROCEED
8784  037564                                ERROR                   ;ELSE, REPORT IT
8785  037564  104460                                                        TRAP    C$ERROR
8786  037566                                ESCAPE  TST             ;       AND EXIT THIS TEST
8787  037566  104410                                                        TRAP    C$ESCAPE
8788  037570  000272                                                        .WORD   L10076-.
8789  037572  004737  036112                JSR     PC,GETT1        ;THIS SHOULDN'T CLEAR 'T1''
8790  037576  102002                        BVC     .+6             ;IF NO ERROR, PROCEED
8791  037600                                ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
8792  037600  104410                                                        TRAP    C$ESCAPE
8793  037602  000256                                                        .WORD   L10100-.
8794  037604  103406                        BCS     16$             ;IT DIDN'T -- GOOD.
8795  037606                                GEDF    EM50M,ERR50     ;WOOPS, IT DID!!  REPORT FAILURE
8796                                                                ;       'DEVICE FATAL'' ERROR # 100
8797  037606  104455                                                        TRAP    C$ERDF
8798  037610  000144                                                        .WORD   100
8799  037612  017012                                                        .WORD   EM50M
8800  037614  010762                                                        .WORD   ERR50
8801  037616                                ESCAPE  SUB             ;       THE REST OF THIS TEST IS INVALID TOO!
8802  037616  104410                                                        TRAP    C$ESCAPE
8803  037620  000240                                                        .WORD   L10100-.
8804  037622  004737  036276        16$:    JSR     PC,GETPB7       ;'PB7'' SHOULD BE LOW HERE
8805  037626  102002                        BVC     .+6             ;IF NO ERROR, PROCEED
8806  037630                                ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
8807  037630  104410                                                        TRAP    C$ESCAPE
8808  037632  000226                                                        .WORD   L10100-.
8809  037634  103054                        BCC     17$             ;IT WASN'T, GOOD.
8810  037636  004537  004064                JSR     R5,READ         ;GET IFR FOR ERROR MESSAGE
8811  037642  120015                        IFR
8812  037644  002472                        TMPD
8813  037646  103003                        BCC     .+10            ;IF NO ERROR, PROCEED
8814  037650                                ERROR                   ;ELSE, REPORT IT
8815  037650  104460                                                        TRAP    C$ERROR
8816  037652                                ESCAPE  TST             ;       AND EXIT THIS TEST
8817  037652  104410                                                        TRAP    C$ESCAPE
8818  037654  000206                                                        .WORD   L10076-.
8819  037656  004537  004064                JSR     R5,READ         ;GET T1CL FOR ERROR MESSAGE
```

```
8820  037662  120004                  T1CL
8821  037664  002450                  TMP4
8822  037666  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
8823  037670                          ERROR                   ;ELSE, REPORT IT
8824  037670  104460                                                          TRAP    C$ERROR
8825  037672                          ESCAPE  TST             ;       AND EXIT THIS TEST
8826  037672  104410                                                          TRAP    C$ESCAPE
8827  037674  000166                                                          .WORD   L10076-.
8828  037676  004537  004064          JSR     R5,READ         ;GET T1CH FOR ERROR MESSAGE
8829  037702  120005                  T1CH
8830  037704  002452                  TMP5
8831  037706  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
8832  037710                          ERROR                   ;ELSE, REPORT IT
8833  037710  104460                                                          TRAP    C$ERROR
8834  037712                          ESCAPE  TST             ;       AND EXIT THIS TEST
8835  037712  104410                                                          TRAP    C$ESCAPE
8836  037714  000146                                                          .WORD   L10076-.
8837  037716  004537  004064          JSR     R5,READ         ;GET T1LL FOR ERROR MESSAGE
8838  037722  120006                  T1LL
8839  037724  002454                  TMP6
8840  037726  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
8841  037730                          ERROR                   ;ELSE, REPORT IT
8842  037730  104460                                                          TRAP    C$ERFOR
8843  037732                          ESCAPE  TST             ;       AND EXIT THIS TEST
8844  037732  104410                                                          TRAP    C$ESCAPE
8845  037734  000126                                                          .WORD   L10076-.
8846  037736  004537  004064          JSR     R5,RFAD         ;GET T1LH FOR ERROR MESSAGE
8847  037742  120007                  T1LH
8848  037744  002456                  TMP7
8849  037746  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
8850  037750                          ERROR                   ;ELSE, REPORT IT
8851  037750  104460                                                          TRAP    C$ERROR
8852  037752                          ESCAPE  TST             ;       AND EXIT THIS TEST
8853  037752  104410                                                          TRAP    C$ESCAPE
8854  037754  000106                                                          .WORD   L10076-.
8855  037756                          GEDF    EM50Y,ERR50     ;IT WAS!  REPORT IT BEING RESET BY WRITTING T1LL
8856                                                          ;       'DEVICE FATAL'' ERROR # 101
8857  037756  104455                                                          TRAP    C$ERDF
8858  037760  000145                                                          .WORD   101
8859  037762  017417                                                          .WORD   EM50Y
8860  037764  010762                                                          .WORD   ERR50
8861
8862                          ; AT THE ABOVE 'PB7'' TEST, IT SHOULD BE LOW.  NOT BECAUSE OF ANY READ/WRITE
8863                          ; OPERATION, BUT BECAUSE OF WHERE WE ARE IN THE CYCLING OF TIMER # 1.  'PB7''
8864                          ; SHOULD BE LOW HERE UNTIL T1 TIMES OUT.
8865
8866  037766  112737  000252  002457  17$:    MOVB    #252,TMP7+1     ;SETUP FOR AND
8867  037774  004537  004310          JSR     R5,WRITE        ;  LOAD T1LH (ADDR 7)
8868  040000  120007                  T1LH
8869  040002  002457                  TMP7+1                  ;  WITH 252 OCTAL
8870  040004  103003                  BCC     .+10            ;IF NO ERROR, PROCEED
8871  040006                          ERROR                   ;ELSE, REPORT IT
8872  040006  104460                                                          TRAP    C$ERROR
8873  040010                          ESCAPE  TST             ;       AND EXIT THIS TEST
8874  040010  104410                                                          TRAP    C$ESCAPE
8875  040012  000050                                                          .WORD   L10076-.
```

```
8876  040014  004737  036112          JSR     PC,GETT1        ;THIS SHOULD CLEAR 'T1'
8877  040020  102002                  BVC     .+6             ;IF NO ERROR, PROCEED
8878  040022                          ESCAPE  SUB             ;ELSE, IT'S ALREADY BEEN REPORTED -- EXIT
8879  040022  104410                                                          TRAP    C$ESCAPE
8880  040024  000034                                                          .WORD   L10100-.
8881  040026  103006                  BCC     18$             ;IT DID -- GOOD.
8882  040030                          GEDF    EM50A,ERR50     ;NOP!  REPORT:  'T1' NOT CLEARED BY LOADING T1LH
8883                                                          ;       'DEVICE FATAL" ERROR # 102
8884  040030  104455                                                          TRAP    C$ERDF
8885  040032  000146                                                          .WORD   102
8886  040034  016067                                                          .WORD   EM50A
8887  040036  010762                                                          .WORD   ERR50
8888  040040                          ESCAPE  SUB
8889  040040  104410                                                          TRAP    C$ESCAPE
8890  040042  000016                                                          .WORD   L10100-.
8891  040044  004537  004660  18$:    JSR     R5,INIT1        ;RE-INITIALIZE IT TO STOP ITS FUNCTIONING
8892  040050  000001                  1
8893  040052  000000                  0
8894  040054  103001                  BCC     .+4             ;IF NO ERROR, EXIT
8895  040056                          ERROR                   ;ELSE, REPORT IT
8896  040056  104460                                                          TRAP    C$ERROR
8897                                  ;THAT'S ALL FOLKS!
8898  040060                          ENDSUB
8899  040060                                                  L10100:
8900  040060  104403                                                          TRAP    C$ESUB
8901  040062                          ENDTST
8902  040062                                                  L10076:
8903  040062  104401                                                          TRAP    C$ETST
8904
8905
8906
```

```
                        .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.
                        ;////////////////////////////////////////////////////////////////

040064                          BGNHRD
040064  000015                                                    .WORD L10101-L$HARD/2
040066                                                  L$HARD::
040066                          GPRMA   ADDRES,0,0,160020,177776,YES
040066  000031                                                    .WORD   T$CODE
040070  040120                                                    .WORD   ADDRES
040072  160020                                                    .WORD   T$LOLIM
040074  177776                                                    .WORD   T$HILIM
040076                          GPRMA   VECTOR,2,0,0,674,YES
040076  001031                                                    .WORD   T$CODE
040100  040146                                                    .WORD   VECTOR
040102  000000                                                    .WORD   T$LOLIM
040104  000674                                                    .WORD   T$HILIM
040106                          GPRMD   PRIRTY,4,0,7000,0,7,YES
040106  002032                                                    .WORD   T$CODE
040110  040177                                                    .WORD   PRIRTY
040112  007000                                                    .WORD   7000
040114  000000                                                    .WORD   T$LOLIM
040116  000007                                                    .WORD   T$HILIM

040120                          ENDHRD
                                                                  .EVEN
040120                                                  L10101:

                                .NLIST  BEX
040120  042504  044526  042503  ADDRES: .ASCIZ  /DEVICE CSR ADDRESS : /
040146  042504  044526  042503  VECTOR: .ASCIZ  /DEVICE VECTOR ADDRESS : /
040177     104  053105  041511  PRIRTY: .ASCIZ  /DEVICE PRIORITY LEVEL : /
                                .LIST   BEX
                                .EVEN
```

```
                        .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.
                        ;////////////////////////////////////////////////////////////////

040230                          BGNSFT
040230  000000                                                  .WORD L10102-L$SOFT/2
040232                                                  L$SOFT::
040232                          ENDSFT
                                                                .EVEN
040232                                                  L10102:
```

```
                          .SBTTL PATCH AREA FOR DEBUG
040232                    PATCH:
        040332                    .=.+100
040332  000240                    NOP
040334  000240                    NOP
040336  000240                    NOP

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

                          .SBTTL ''ENDMOD'' & ''LASTAD''
040340                            ENDMOD
040340                            LASTAD
                                                                            .EVEN
040340  000000                                                              .WORD   0
040342  000000                                                              .WORD   0
040344                    L$LAST::
        000001            .END
```

```
ACR    = 120013          1652#  2488   2497   6009   6425   6493   6515   6520   6781   6860   7447   7568
ADDRES  040120           8925   8944#
ADR    = 000020 G        1507#
AD.HIT  020322           3665   3697#
AD.OK   020316           3689   3693#
ASSEMB= 000010           1242
BDATA   002312           1721#  2552   2555   2671   2750   2988   3338   3900*  4006*  4081*  4147*  4210*  4223*
                         4280*  4287*  4294*  4301*  4326*  4349*  4358*  4367*  4374*  4430*  4487*  4489   4504*
                         4506   4521*  5245   5250   5267   5272   5302   5303   5319   5324   5636   5637   5651
                         5652   5656   5657   5680   5681   5706   5707   5721   5725   5746   5747   5802   5803
                         5817   5818   5874   5875   5889   5890   6209   6217   6245   6253   6319   6321   6384
                         6386   6451   6453   6516   6518   5581   6583   6648   6650
BIT0   = 000001 G        1480#  1551   1569   1587   1598   1667   3201   3573   4175   4926
BIT00  = 000001 G        1469#  1480
BIT01  = 000002 G        1468#  1479
BIT02  = 000004 G        1467#  1478
BIT03  = 000010 G        1466#  1477
BIT04  = 000020 G        1465#  1476
BIT05  = 000040 G        1464#  1475
BIT06  = 000100 G        1463#  1474
BIT07  = 000200 G        1462#  1473
BIT08  = 000400 G        1461#  1472
BIT09  = 001000 G        1460#  1471
BIT1   = 000002 G        1479#  1550   1564   1666   3173   4656   4658   4951   4953   4961   4996
BIT10  = 002000 G        1459#
BIT11  = 004000 G        1458#
BIT12  = 010000 G        1457#
BIT13  = 020000 G        1456#
BIT14  = 040000 G        1455#
BIT15  = 100000 G        1454#
BIT2   = 000004 G        1478#  1549   1563   1665   3115   3140   3197   4698   4700   4951   4996   4998   5007
BIT3   = 000010 G        1477#  1532   1548   1664
BIT4   = 000020 G        1476#  1547   1588   1663
BIT5   = 000040 G        1475#  1546   1662
BIT6   = 000100 G        1474#  1545   1597   1661   2466   2476   2479   2493   3241   8379   8588
BIT7   = 000200 G        1473#  1544   1596   1612   1660   2466   2493   3241   7429   7560   8588
BIT8   = 000400 G        1472#
BIT9   = 001000 G        1471#
BOE    = 000400 G        1511#
BSEL    002352           1783#  3890   3900   3950   3961   3988*  3994   4006
BSELRS  003042           2049#  2181   2185
BSEL0   002352           1782#  2404   3672   3678   3770   3786   4074*  4075   4081   4126*  4127   4142   4147
                         4149*  4157*  4189*  4190   4204   4210   4212*  4223   4225*  4234*  4428   4444*  4461
                         4521   6621*
BSEL1   002354           1785#  2165*  2175   2405   4058*  4446*  4472*
BSEL10  002372           1795#  2412
BSEL11  002374           1797#  2413
BSEL12  002376           1798#  2414
BSEL13  002400           1800#  2415
BSEL14  002402           1801#  2416
BSEL15  002404           1803#  2417
BSEL16  002406           1804#  2418
BSEL17  002410           1806#  2419
BSEL2   002356           1786#  2226   2258*  2265   2301*  2308   2365*  2372   2406   4322*  4324   4326   4340
                         4447*  4457   4504   8274*  8276
BSEL3   002360           1788#  2407   2477*  8273*
```

```
BSEL4   002362           1789#   2185    2408
BSEL5   002364           1791#   2409
BSEL6   002366           1792#   2181    2280    2410
BSEL7   002370           1794#   2411
BSLT0 = 000020           1625#
BSLT1 = 000021           1626#
BSLT2 = 000022           1628#
BSLT3 = 000023           1629#
BSLT4 = 000024           1631#
BSLT5 = 000025           1632#
BSLT6 = 000026           1634#
BSLT7 = 000027           1635#
BSR0    002246           1692#   2404*   3365
BSR1    002250           1694#   2405*   3363
BSR10   002266           1707#   2412*   3407
BSR11   002270           1708#   2413*   3405
BSR12   002272           1709#   2414*   3403
BSR13   002274           1710#   2415*   3401
BSR14   002276           1711#   2416*   3428
BSR15   002300           1712#   2417*   3426
BSR16   002302           1713#   2418*   3424
BSR17   002304           1714#   2419*   3422
BSR2    002252           1696#   2406*   3361
BSR3    002254           1698#   2407*   3359
BSR4    002256           1700#   2408*   3386
BSR5    002260           1702#   2409*   3384
BSR6    002262           1704#   2410*   3382
BSR7    002264           1706#   2411*   3380

BT1   = 003122   2095#   2805    2903    5184    5201
BT2   = 003206   2096#   2835    2933    5202
BUFARE  003122   2072#   2078    2095    2096
CONSOL  002346   1737#   3551*   3642*
CONTIN  020074   3545    3613#
CONTST  020174   3554    3642#
CSREGS= 000020   1521#   3960    3970    3992    4095
C$AU  = 000052   1242#   3744
C$AUTO= 000061   1242#   3696
C$BRK = 000022   1242#   4586    4601    4933
C$BSEG= 000004   1242#   5623    5790    5862
C$BSUB= 000002   1242#   4267    4320    5372    5427    5493    5614    5774    5846    5950    6005    6060    6121
                 6719    7419    8369    8558
C$CEFG= 000045   1242#
C$CLCK= 000062   1242#
C$CLEA= 000012   1242#   3716
C$CLOS= 000035   1242#
C$CLP1= 000006   1242#
C$CVEC= 000036   1242#   3562    3687    3710    3713    3795
C$DCLN= 000044   1242#
C$DODU= 000051   1242#   3692
C$DRPT= 000024   1242#
C$DU  = 000053   1242#   3731
C$EDIT= 000003   1242#   1316
C$ERDF= 000055   1242#   2587    2621    3802    3907    4012    4085    4153    4217    4230    4310    4332    4382
                 4435    4494    4511    4527    4956    5001    5219    5256    5277    5309    5330    5642    5663
                 5686    5712    5729    5752    5808    5824    5880    5896    6222    6258    6326    6391    6458
                 6523    6588    6655    6791    6849    6902    6949    6995    7055    7088    7117    7155    7178
```

```
                    7197  7211  7253  7295  7341  7405  7493  7537  7635  7661  7705  7773  7824
                    7874  7903  7927  7946  7960  7984  8036  8054  8085  8131  8198  8394  8419
                    8444  8483  8497  8522  8547  8603  8628  8647  8674  8694  8713  8755  8772
                    8797  8857  8884
C$ERHR= 000056       1242#
C$ERRO= 000060       1242#  3882  4044  4123  4139  4186  4271  4416  4426  4563  4578  4596  4613
                    4865  4892  4911  4940  4972  4985  5103  5143  5151  5158  5176  5191  5234
                    5241  5248  5270  5290  5297  5322  5361  5380  5416  5435  5472  5482  5501
                    5588  5601  5939  5958  5994  6013  6049  6068  6109  6129  6166  6181  6192
                    6200  6212  6237  6248  6289  6303  6311  6354  6368  6376  6419  6436  6444
                    6486  6500  6508  6551  6565  6573  6616  6632  6640  6725  6734  6749  6758
                    6767  6776  6785  6810  6825  6834  6843  6864  6874  6884  6911  6923  6934
                    6943  6959  6971  6980  6989  7010  7020  7040  7049  7073  7082  7097  7112
                    7121  7138  7149  7172  7189  7223  7238  7247  7265  7280  7289  7311  7326
                    7335  7357  7372  7381  7390  7399  7423  7432  7451  7460  7469  7478  7487
                    7506  7522  7531  7554  7563  7572  7593  7602  7611  7620  7629  7642  7653
                    7668  7678  7690  7699  7720  7740  7749  7758  7767  7791  7800  7809  7818
                    7834  7850  7859  7868  7885  7897  7921  7938  7972  7997  8006  8021  8030
                    8064  8079  8101  8116  8125  8141  8156  8165  8174  8183  8192  8242  8306
                    8373  8382  8432  8451  8471  8510  8535  8562  8572  8582  8591  8662  8723
                    8743  8785  8815  8824  8833  8842  8851  8872  8896
C$ERSF= 000054       1242#
C$ERSO= 000057       1242#
C$ESCA= 000010       1242#  4337  4440  4499  4516  4532  4565  4580  4867  4894  4913  4942  4974
                    4987  5224  5261  5282  5314  5335  5363  5382  5418  5437  5474  5484  5503
                    5590  5603  5941  5960  5996  6015  6051  6070  6111  6131  6168  6183  6194
                    6202  6214  6239  6250  6291  6305  6313  6356  6370  6378  6421  6438  6446
                    6488  6502  6510  6553  6567  6575  6618  6634  6642  6727  6736  6741  6751
                    6760  6769  6778  6787  6812  6817  6827  6836  6845  6854  6866  6876  6886
                    6897  6913  6925  6936  6945  6961  6973  6982  6991  7000  7012  7022  7032
                    7042  7051  7060  7065  7075  7084  7099  7104  7114  7123  7140  7151  7164
                    7174  7191  7206  7225  7230  7240  7249  7267  7272  7282  7291  7300  7313
                    7318  7328  7337  7346  7359  7364  7374  7383  7392  7401  7425  7434  7442
                    7453  7462  7471  7480  7489  7508  7513  7524  7533  7542  7556  7565  7574
                    7585  7595  7604  7613  7622  7631  7644  7655  7670  7680  7692  7701  7710
                    7722  7732  7742  7751  7760  7769  7778  7783  7793  7802  7811  7820  7836
                    7841  7852  7861  7870  7887  7899  7912  7923  7940  7955  7974  7979  7999
                    8008  8013  8023  8032  8041  3049  8066  8071  8081  8090  8103  8108  8118
                    8127  8143  8148  8158  8167  8176  8185  8194  8375  8384  8389  8399  8413
                    8424  8434  8439  8453  8461  8473  8478  8491  8502  8512  8517  8527  8537
                    8542  8564  8574  8584  8593  8598  8608  8622  8633  8642  8652  8664  8669
                    8679  8688  8699  8708  8725  8733  8745  8750  8760  8766  8777  8787  8792
                    8802  8807  8817  8826  8835  8844  8853  8874  8879  8889
C$ESEG= 000005       1242#  5761  5833  5905
C$ESUB= 000003       1242#  4316  4388  5387  5442  5508  5769  5841  5913  5965  6020  6075  6136
                    7412  8204  8554  8900
C$ETST= 000001       1242#  3808  3913  4018  4101  4160  4237  4391  4539  4616  5106  5340  5394
                    5449  5515  5917  5972  6027  6081  6143  6265  6333  6398  6465  6530  6595
                    6662  8207  8903
C$EXIT= 000032       1242#
C$GETB= 000026       1242#
C$GETW= 000027       1242#
C$GPAN= 000043       1242#
C$GPHR= 000042       1242#  3580
C$GPLO= 000030       1242#
C$GPRI= 000040       1242#
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C$INIT= 000011          1242#  3636
C$INLP= 000020          1242#
C$MANI= 000050          1242#
C$MEM = 000031          1242#
C$MSG = 000023          1242#  2652  2683  2693  2733  2760  2967  2999  3057  3160  3322  3850
C$OPEN= 000034          1242#
C$PNTB= 000014          1242#  2664  2677  2745  2755  2981  2994  3486  3826
C$PNTF= 000017          1242#
C$PNTS= 000016          1242#
C$PNTX= 000015          1242#  2709  2726  2774  2793  2803  2823  2833  2853  2863  2872  2891  2901
                        2921   2931  2951  2961  3019  3027  3035  3043  3051  3082  3090  3113  3121
                        3129   3138  3146  3154  3195  3216  3224  3253  3261  3278  3288  3305  3315
                        3355   3369  3376  3390  3397  3411  3418  3432  3447  3457  3464  3474  3832
                        3838   3846  6799
C$QIO = 000377          1242#
C$RDBU= 000007          1242#
C$REFG= 000047          1242#  3522  3528  3534  3540
C$RESE= 000033          1242#  3728  4194
C$REVI= 000003          1242#  1315
C$RFLA= 000021          1242#
C$RPT = 000025          1242#
C$SEFG= 000046          1242#
C$SPRI= 000041          1242#
C$SVEC= 000037          1242#  3557  3620  3628  3668  3776
C$TPRI= 000013          1242#
DDRA  = 120003          1642#  5230  5266  5293  5301  5431  6361  6383  6388
DDRB  = 120002          1641#  5237  5244  5286  5318  5376  5478  6177  6208  6219  6233  6296  6318
                        6323   6870  7006  7550  7716  7993  8568
DELAY1  002316          1723#  2170  4199  4200
DELAY2  002320          1724#  4456  4478
DEVMAP  002342          1735#  3567* 3587*
DEVPTR  002344          1736#  3573* 3584*  3587  3588*
DFPTBL  002216 G        1408#
DIAGMC= 000000          1242
DMVDAI= 000001          1551#
DMVPU = 000004          1549#  1555  1556  1557
EF.CON= 000036 G        1487#  3539
EF.NEW= 000035 G        1488#  3533
EF.PWR= 000034 G        1489#
EF.RES= 000037 G        1486#  3527
EF.STA= 000040 G        1485#  3521
EM14    014667          3494#  3909
EM15    014733          3494#  4334
EM16    015013          3494#  4437
EM17    015110          3494#  4496
EM17A   015170          3494#  4513  4529
EM20    015243          3494#  5221  5644  5688  5714  5754  5810  5882
EM20A   015275          3494#  5665  5731
EM20B   015355          3494#  5826  5898
EM21    015442          3494#  5258  5311
EM22    015477          3494#  5279
EM22A   015532          3494#  5332
EM25    015565          2565   3494#
EM3     014454          2234   3494#
EM34    015613          2589   3494#
EM34B   015644          2623   3494#
```

CVDMAA.P11 12-DEC-80 15:59 CROSS REFERENCE TABLE -- USER SYMBOLS

```
EM4      014500          2274    2317    2380    3494#   8283
EM47A    015675          3494#   4663
EM47B    015735          3494#   4705
EM48A    016016          3494#   4958    5003
EM5      014515          3494#   4155    6224    6260    6328    6393    6460    6525    6590    6657
EM50A    016067          3494#   6793    7495    8396    8549    8605    8886
EM50B    016135          3494#   6851    7539
EM50C    016203          3494#   7255    7986    8485    8757
EM50D    016251          3494#   6951    7663
EM50E    016305          3494#   6997    7707
EM50F    016341          3494#   7057    7775    8421    8630
EM50G    016406          3494#   7129    7876    8446    8676
EM50H    016450          3494#   7157    7905
EM50I    016536          3494#   7180    7929
EM50J    016600          3494#   7199    7948
EM50K    016666          3494#   7213    7962
EM50L    016730          3494#   7297    8038    8696
EM50M    017012          3494#   7343    8087    8524    8799
EM50N    017054          3494#   7407    8133
EM50S    017122          3494#   7826
EM50U    017174          3494#   8056    8649
EM50V    017240          3494#   7637    8200
EM50W    017305          3494#   6904    7090
EM50X    017354          3494#   8499    8774
EM50Y    017417          3494#   8859
EM50Z    017471          3494#   8715
EM6      014540          3494#   4014
EM7      014564          3494#   4087    4312    4384
EM8      014611          3494#   4232
EM9      014634          3494#   4219
ENDEMB   012114          3483    3494#
ENDT7    022614          4272    4372    4386#
ERRBLK   002244  G       1686#   2195*   2235*   2275*   2318*   2381*   2566*   4664*   4706*   8284*
ERRFLG   002332          1731#   5205*   5212*   5215
ERRMSG   002242  G       1685#   2194*   2234*   2274*   2317*   2380*   2565*   4663*   4705*   8283*
ERRNBR   002240  G       1684#   2193*   2233*   2273*   2316*   2379*   2564*   4662*   4704*   8282*
ERRTYP   002236  G       1683#   2192*   2232*   2272*   2315*   2378*   2563*   4661*   4703*   8281*
ERR1     005276  G       2648#   6905
ERR2     005304  G       2657#   3910    4015    4088    4156    4220    4233    4335    4497    4514    4530
ERR3     005414  G       2195    2590    2624    2688#
ERR4     005426  G       2235    2275    2318    2381    2698#   8284
ERR4$    011322          2679    2689    3349#
ERR47    006724  G       3004#   4664    4706
ERR47.   007110          3054    3062#   4667    4709
ERR48    007632  G       3106#   4959    5004
ERR48.   010030          3157    3165#   4962    5008
ERR5     005552  G       2738#   4313    4385    4438
ERR5$    011710          2730    2757    3440#
ERR50    010762  G       3236#   6794    6852    6952    6998    7058    7091    7130    7158    7181    7200    7214    7256
                         7298    7344    7408    7496    7540    7638    7664    7708    7776    7827    7877    7906    7930
                         7949    7963    7987    8039    8057    8088    8134    8201    8397    8422    8447    8486    8500
                         8525    8550    8606    8631    8650    8677    8697    8716    8758    8775    8800    8860    8887
ERR6     005650  G       2765#   5222
ERR7     006612  G       2566    2972#   5259    5280    5312    5333    5645    5666    5689    5715    5732    5755    5811
                         5827    5883    5899    6225    6261    6329    6394    6461    6526    6591    6658
ER47CT   007104          3053*   3059#   3064    3066*   3084    4604*
```

```
ER47MX  007106          3060#   3064    3084
ER48CT  010024          3156*   3162#   3167    3169*   3218    5036*   5075*
ER48MX  010026          3163#   3167    3218
EVL   = 000004 G        1505#
EXECUT= 000005          1610#
ESEND = 002100          1242#
ESLOAD= 000035          1242#   1339
FMT02   012124          2661    2742    3494#
FMT02A  012161          2674    2991    3494#
FMT06   012562          2771    2869    3494#
FMT06A  012571          2790    2820    2850    2888    2918    2948    3494#
FMT06B  012637          2800    2830    2860    2898    2928    2958    3494#
FMT07   012530          2978    3494#
FMT10   012654          2752    3494#
FMT11   012730          3454    3471    3494#
FMT4    012245          3352    3444    3494#
FMT4A   012305          3366    3408    3494#
FMT4B   012340          3373    3394    3415    3461    3494#
FMT4C   012345          3387    3429    3494#
FMT47A  007232          3016    3094#
FMT47B  007263          3024    3094#
FMT47C  007322          3032    3094#
FMT47E  007350          3040    3094#
FMT47G  007407          3079    3094#
FMT48A  010300          3110    3228#
FMT48B  010347          3118    3228#
FMT48C  010402          3126    3228#
FMT48E  010437          3135    3228#
FMT48F  010506          3143    3228#
FMT48G  010551          3192    3228#
FMT48H  010611          3213    3228#
FMT48I  010644          3087    3221    3228#
FMT5    012400          2706    3494#
FMT5A   012443          2723    3494#
FMT50A  012747          3250    3494#
FMT50B  013021          3258    3494#
FMT50C  013102          3275    3302    3494#
FMT50D  013142          3285    3494#
FMT50E  013157          3312    3494#
FMT50M  013174          3494#   6796
FRSPAS  002340          1734#   3572*
FRSTIM  002336          1733#   3633*
FSAU  = 000015          1242#   3741    3743
FSAUTO= 000020          1242#   3662    3695
FSBGN = 000040          1242#   1244    2580    2614    2648    2657    2688    2698    2738    2765    2972    3004    3106
                        3236    3503    3516    3662    3707    3725    3741    3767    3807    3820    3875    3912    3930
                        4017    4037    4100    4114    4159    4174    4236    4264    4266    4315    4319    4337    4387
                        4390    4411    4440    4499    4516    4532    4538    4559    4565    4580    4615    4861    4867
                        4894    4913    4942    4974    4987    5105    5139    5224    5261    5282    5314    5335    5339
                        5357    5363    5371    5382    5386    5393    5412    5418    5426    5437    5441    5448    5468
                        5474    5484    5492    5503    5507    5514    5581    5590    5603    5613    5623    5768    5773
                        5790    5840    5845    5862    5912    5916    5935    5941    5949    5960    5964    5971    5990
                        5996    6004    6015    6019    6026    6045    6051    6059    6070    6074    6080    6105    6111
                        6120    6131    6135    6142    6161    6168    6183    6194    6202    6214    6239    6250    6264
                        6284    6291    6305    6313    6332    6349    6356    6370    6378    6397    6414    6421    6438
                        6446    6464    6481    6488    6502    6510    6529    6546    6553    6567    6575    6594    6611
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                    6618  6634  6642  6661  6716  6718  6727  6736  6741  6751  6760  6769  6778
                    6787  6812  6817  6827  6836  6845  6854  6866  6876  6886  6897  6913  6925
                    6936  6945  6961  6973  6982  6991  7000  7012  7022  7032  7042  7051  7060
                    7065  7075  7084  7099  7104  7114  7123  7140  7151  7164  7174  7191  7206
                    7225  7230  7240  7249  7267  7272  7282  7291  7300  7313  7318  7328  7337
                    7346  7359  7364  7374  7383  7392  7401  7411  7418  7425  7434  7442  7453
                    7462  7471  7480  7489  7508  7513  7524  7533  7542  7556  7565  7574  7585
                    7595  7604  7613  7622  7631  7644  7655  7670  7680  7692  7701  7710  7722
                    7732  7742  7751  7760  7769  7778  7783  7793  7802  7811  7820  7836  7841
                    7852  7861  7870  7887  7899  7912  7923  7940  7955  7974  7979  7999  8008
                    8013  8023  8032  8041  8049  8066  8071  8081  8090  8103  8108  8118  8127
                    8143  8148  8158  8167  8176  3185  8194  8203  8206  8366  8368  8375  8384
                    8389  8399  8413  8424  8434  8439  8453  8461  8473  8478  8491  8502  8512
                    8517  8527  8537  8542  8553  8557  8564  8574  8584  8593  8598  8608  8622
                    8633  8642  8652  8664  8669  8679  8688  8699  8708  8725  8733  8745  8750
                    8760  8766  8777  8787  8792  8802  8807  8817  8826  8835  8844  8853  8874
                    8879  8889  8899  8902  8920  8960  8976
FSCLEA= 000007       1242#  3707  3715
FSDU  = 000016       1242#  3725  3730
FSEND = 000041       1242#  1244  2601  2635  2653  2684  2694  2734  2761  2968  3000  3058  3161
                     3323  3637  3697  3717  3732  3745  3767  3807  3809  3851  3875  3912  3914
                     3930  4017  4019  4037  4100  4102  4114  4159  4161  4174  4236  4238  4264
                     4266  4315  4317  4319  4337  4387  4389  4390  4392  4411  4440  4499  4516
                     4532  4538  4540  4559  4565  4580  4615  4617  4861  4867  4894  4913  4942
                     4974  4987  5105  5107  5139  5224  5261  5282  5314  5335  5339  5341  5357
                     5363  5371  5382  5386  5388  5393  5395  5412  5418  5426  5437  5441  5443
                     5448  5450  5468  5474  5484  5492  5503  5507  5509  5514  5516  5581  5590
                     5603  5613  5762  5768  5770  5773  5834  5840  5842  5845  5906  5912  5914
                     5916  5918  5935  5941  5949  5960  5964  5966  5971  5973  5990  5996  6004
                     6015  6019  6021  6026  6028  6045  6051  6059  6070  6074  6076  6080  6082
                     6105  6111  6120  6131  6135  6137  6142  6144  6161  6168  6183  6194  6202
                     6214  6239  6250  6264  6266  6284  6291  6305  6313  6332  6334  6349  6356
                     6370  6378  6397  6399  6414  6421  6438  6446  6464  6466  6481  6488  6502
                     6510  6529  6531  6546  6553  6567  6575  6594  6596  6611  6618  6634  6642
                     6661  6663  6716  6718  6727  6736  6741  6751  6760  6769  6778  6787  6812
                     6817  6827  6836  6845  6854  6866  6876  6886  6897  6913  6925  6936  6945
                     6961  6973  6982  6991  7000  7012  7022  7032  7042  7051  7060  7065  7075
                     7084  7099  7104  7114  7123  7140  7151  7164  7174  7191  7206  7225  7230
                     7240  7249  7267  7272  7282  7291  7300  7313  7318  7328  7337  7346  7359
                     7364  7374  7383  7392  7401  7411  7413  7418  7425  7434  7442  7453  7462
                     7471  7480  7489  7508  7513  7524  7533  7540  7556  7565  7574  7585  7595
                     7604  7613  7622  7631  7644  7655  7670  7680  7692  7701  7710  7722  7732
                     7742  7751  7760  7769  7778  7783  7793  7802  7811  7820  7836  7841  7852
                     7861  7870  7887  7899  7912  7923  7940  7955  7974  7979  7999  8008  8013
                     8023  8032  8041  8049  8066  8071  8081  8090  8103  8108  8118  8127  8143
                     8148  8158  8167  8176  8185  8194  8203  8205  8206  8206  8366  8368  8375
                     8384  8389  8399  8413  8424  8434  8439  8453  8461  8473  8478  8491  8502
                     8512  8517  8527  8537  8542  8553  8555  8557  8564  8574  8584  8593  8598
                     8608  8622  8633  8642  8652  8664  8669  8679  8688  8699  8708  8725  8733
                     8745  8750  8760  8766  8777  8787  8792  8802  8807  8817  8826  8835  8844
                     8853  8874  8879  8889  8899  8901  8902  8904  8943  8965  8976
FSHARD= 000004        1242#  8920  8941
FSHW  = 000013        1242#  1406  1428
FSINIT= 000006        1242#  3516  3635
FSJMP = 000050        1242#
FSMOD = 000000        1242#  1244  8976
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F$MSG = 000011          1242#  2648  2651  2657  2682  2688  2692  2698  2732  2738  2759  2765  2966
                        2972   2998  3004  3056  3106  3159  3236  3321  3820  3849
F$PROT= 000021          1242#  3503  3508
F$PWR = 000017          1242#
F$RPT = 000012          1242#
F$SEG = 000003          1242#  5623  5760  5790  5832  5862  5904
F$SOFT= 000005          1242#  8960  8963
F$SRV = 000010          1242#  2580  2599  2614  2633
F$SUB = 000002          1242#  4267  4315  4320  4387  5372  5386  5427  5441  5493  5507  5614  5768
                        5774   5840  5846  5912  5950  5964  6005  6019  6060  6074  6121  6135  6719
                        7411   7419  8203  8369  8553  8558  8899
F$SW  = 000014          1242#  1437  1441
F$TEST= 000001          1242#  3768  3807  3876  3912  3931  4017  4038  4100  4115  4159  4175  4236
                        4265   4390  4412  4538  4560  4615  4862  5105  5140  5339  5358  5393  5413
                        5448   5469  5514  5582  5916  5936  5971  5991  6026  6046  6080  6106  6142
                        6162   6264  6285  6332  6350  6397  6415  6464  6482  6529  6547  6594  6612
                        6661   6717  8206  8367  8902
GDATA   002310          1720#  2229* 2269* 2312* 2375* 2555  2673  2700  2722  2751  2990  3337  3902*
                        4005*  4060* 4072* 4074  4075  4146* 4213* 4226* 4281* 4288* 4295* 4302* 4328*
                        4348*  4357* 4366* 4373* 4431* 4489* 4490* 4506* 4507* 4523* 5252* 5264* 5272
                        5305*  5326* 5375* 5430* 5496* 5620* 5637  5652  5657  5671* 5681  5694* 5707
                        5725   5737* 5747  5780* 5803  5820* 5852* 5875  5892* 5953* 6008* 6063* 6124*
                        6171*  6172  6205* 6217  6227* 6228  6242* 6253  6294* 6295  6316* 6321  6359*
                        6360   6381* 6386  6427* 6428  6453  6491* 6492  6513* 6518  6556* 6557  6578*
                        6583   6623* 6624  6645* 6650
GETBSR  004434          2189   2404# 2584  2618  3901  4007  4082  4148  4211  4224  4327  4488  4505
                        4522
GETPB7  036276          6894   7062  7582  7780  8046  8145  8301# 8639  8705  8804
GETPRM  017764          3543   3576# 3585
GETT1   036112          6738   6814  7029  7101  7161  7203  7227  7269  7315  7361  7439  7510  7729
                        7838   7909  7952  7976  8010  8068  8105  8237# 8386  8410  8436  8458  8475
                        8488   8514  8539  8595  8619  8666  8685  8730  8747  8763  8789  8876
GETWSR  004576          2228   2268  2311  2374  2425# 4343
GS$CNTO= 000200         1242#
GS$DELM= 000372         1242#
GS$DISP= 000003         1242#
GS$EXCP= 000400         1242#
GS$HILI= 000002         1242#
GS$LOLI= 000001         1242#
GS$ND = 000000          1242#
GS$OFFS= 000400         1242#  8924  8929  8934
GS$OFSI= 000376         1242#  8924  8929  8934
GS$PRMA= 000001         1242#  8924  8929
GS$PRMD= 000002         1242#  8934
GS$PRML= 000000         1242#
GS$RADA= 000140         1242#
GS$RADB= 000000         1242#
GS$RADD= 000040         1242#
GS$RADL= 000120         1242#
GS$RADO= 000020         1242#  8924  8929  8934
GS$XFER= 000004         1242#
GS$YES = 000010         1242#  8924  8929  8934
HELP  = 000000          1234#  1261  1357  1397  2132
HOE   = 100000 G        1518#
IPE   = 010000 G        1515#
IDU   = 000040 G        1508#
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IENBA = 000001           1587#
IENBB = 000020           1588#
IENR  = 120016           1655#  2483   6125   6625   6647   6652
IER   = 020000 G         1516#
IFR   = 120015           1654#  6967   7589   8152   8238   8811
IFRCA1= 000002           1666#
IFRCA2= 000001           1667#
IFRCB1= 000020           1663#
IFRCB2= 000010           1664#
IFRIRQ= 000200           1660#
IFRSR = 000004           1665#
IFRT1 = 010100           1661#  8273
IFRT2 = 010040           1662#
IHILNK  005222           2594   2596   2602#  3622*
IHOLNK  005274           2628   2630   2636#  3630*
INITT1  004660           2462#  5596   6729   7427   7558   8377   8586   8891
INTFLG  002326           1727#  2593*  2627*
INTWCH  002330           1729#  2582   2616   3631*
IRQA  = 000004           1563#
IRQB  = 000002           1564#
IRQREG= 123005           1562#
ISR   = 000100 G         1509#
IXE   = 004000 G         1514#
I$AU  = 000041           1242#  3741#  3745#
I$AUTO= 000041           1242#  3662#  3697#
I$CLN = 000041           1242#  3707#  3717#
I$DU  = 000041           1242#  3725#  3732#
I$HRD = 000041           8920#  8943#
I$INIT= 000041           1242#  3516#  3637#
I$MOD = 000041           1242#  1244#  8976#
I$MSG = 000041           1242#  2648#  2653#  2657#  2684#  2688#  2694#  2698#  2734#  2738#  2761#  2765#  2968#
                         2972#  3000#  3004#  3058#  3106#  3161#  3236#  3323#  3820#  3851#
I$PROT= 000040           1242#  3503#
I$PTAB= 000041           1242#
I$PWR = 000041           1242#
I$RPT = 000041           1242#
I$SEG = 000041           1242#  3767   3875   3930   4037   4114   4174   4264   4266   4319   4411   4559   4861
                         5139   5357   5371   5412   5426   5468   5492   5581   5613   5623#  5762#  5773   5790#
                         5834#  5845   5862#  5906#  5935   5949   5990   6004   6045   6059   6105   6120   6161
                         6284   6349   6414   6481   6546   6611   6716   6718   7418   8366   8368   8557
I$SETU= 000041           1242#
I$SFT = 000041           8960#  8965#
I$SRV = 000041           1242#  2580#  2601#  2614#  2635#
I$SUB = 000041           1242#  3767   3875   3930   4037   4114   4174   4264   4266#  4315#  4317#  4319#  4387#
                         4389#  4411   4559   4861   5139   5357   5371#  5386#  5388#  5412   5426#  5441#  5443#
                         5468   5492#  5507#  5509#  5581   5613#  5768#  5770#  5773#  5840#  5842#  5845#  5912#
                         5914#  5935   5949#  5964#  5966#  5990   6004#  6019#  6021#  6045   6059#  6074#  6076#
                         6105   6120#  6135#  6137#  6161   6284   6349   6414   6481   6546   6611   6716   6718#
                         6741   6817   6854   6897   7000   7032   7060   7065   7104   7164   7206   7230   7272
                         7300   7318   7346   7364   7411#  7413#  7418#  7442   7513   7542   7585   7710   7732
                         7778   7783   7841   7912   7955   7979   8013   8041   8049   8071   8090   8108   8148
                         8203#  8205#  8366   8368#  8389   8399   8413   8424   8439   8461   8478   8491   8502
                         8517   8527   8542   8553#  8555#  8557#  8598   8608   8622   8633   8642   8652   8669
                         8679   8688   8699   8708   8733   8750   8760   8766   8777   8792   8802   8807   8879
                         8889   8899#  8901#
I$TST = 000041           1242#  3767#  3807#  3809#  3875#  3912#  3914#  3930#  4017#  4019#  4037#  4100#  4102#
```

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                    4114#  4159#  4161#  4174#  4236#  4238#  4264#  4266   4319   4337   4390#  4392#  4411#
                    4440   4499   4516   4532   4538#  4540#  4559#  4565   4580   4615#  4617#  4861#  4867
                    4894   4913   4942   4974   4987   5105#  5107#  5139#  5224   5261   5282   5314   5335
                    5339#  5341#  5357#  5363   5371   5382   5393#  5395#  5412#  5418   5426   5437   5448#
                    5450#  5468#  5474   5484   5492   5503   5514#  5516#  5581#  5590   5603   5613   5773
                    5845   5916#  5918#  5935#  5941   5949   5960   5971#  5973#  5990#  5996   6004   6015
                    6026#  6028#  6045#  6051   6059   6070   6080#  6082#  6105#  6111   6120   6131   6142#
                    6144#  6161#  6168   6183   6194   6202   6214   6239   6250   6264#  6266#  6284#  6291
                    6305   6313   6332#  6334#  6349#  6356   6370   6378   6397#  6399#  6414#  6421   6438
                    6446   6464#  6466#  6481#  6488   6502   6510   6529#  6531#  6546#  6553   6567   6575
                    6594#  6596#  6611#  6618   6634   6642   6661#  6663#  6716#  6718   6727   6736   6751
                    6760   6769   6778   6787   6812   6827   6836   6845   6866   6876   6886   6913   6925
                    6936   6945   6961   6973   6982   6991   7012   7022   7042   7051   7075   7084   7099
                    7114   7123   7140   7151   7174   7191   7225   7240   7249   7267   7282   7291   7313
                    7328   7337   7359   7374   7383   7392   7401   7418   7425   7434   7453   7462   7471
                    7480   7489   7508   7524   7533   7556   7565   7574   7595   7604   7613   7622   7631
                    7644   7655   7670   7680   7692   7701   7722   7742   7751   7760   7769   7793   7802
                    7811   7820   7836   7852   7861   7870   7887   7899   7923   7940   7974   7999   8008
                    8023   8032   8066   8081   8103   8118   8127   8143   8158   8167   8176   8185   8194
                    8206#  8208#  8366#  8368   8375   8384   8434   8453   8473   8512   8537   8557   8564
                    8574   8584   8593   8664   8725   8745   8787   8817   8826   8835   8844   8853   8874
                    8902#  8904#
JSJMP = 000167       1242#
KICKT1  036150       6906   7639   7665   8264#  8448   8720
LODT1C  036060       6888   7024   7576   7724   8221#  8404   8613
LOE   = 040000 G     1517#
LOGDEV  002322       1725#  3571*  3577*  3579   3691
LOT   = 000010 G     1506#
LSIDCL= 000002       1550#
LSIHLT= 000020       1547#
LU1MOD  002000 G     1244#
LSACP   002110 G     1346#
LSAPT   002036 G     1304#
LSAU    020352 G     1331   3741#
LSAUT   002070 G     1330#
LSAUTO  020204 G     1347   3662#
LSCCP   002106 G     1344#
LSCLEA  020350 G     1345   3707#
LSCO    002032 G     1300#
LSDEPO  002011 G     1282#
LSDESC  003542 G     1337   2121#
LSDESP  002076 G     1336#
LSDEVP  002060 G     1322#
LSDISP  002124 G     1307   1367#
LSDLY   002116 G     1352#
LSDTP   002040 G     1306#
LSDTYP  002034 G     1302#
LSDU    020346 G     1333   3725#
LSDUT   002072 G     1332#
LSDVTY  003522 G     1323   2109#
LSEF    002052 G     1317#
LSENVI  002044 G     1310#
LSERRT  002236 G     1341   1682#
LSETP   002102 G     1340#
LSEXP1  002046 G     1312#
LSEXP4  002064 G     1326#
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LSEXPS  002066 G        1328#
LSHARD  040066 G        1289    8920    8921#
LSHIME  002120 G        1354#
LSHPCP  002016 G        1283#
LSHPTP  002022 G        1292#
LSHW    002216 G        1293    1406    1407#
LSICP   002104 G        1342#
LSINIT  017622 G        1343    3516#
LSLADP  002026 G        1296#
LSLAST  040344 G        1297    8980#
LSLOAD  002100 G        1338#
LSLUN   002074 G        1334#
LSMREV  002050 G        1314#
LSNAME  002000 G        1271#
LSPRIO  002042 G        1308#
LSPROT  017614 G        1349    3503#
LSPRT   002112 G        1348#
LSREPP  002062 G        1324#
LSREV   002010 G        1280#
LSSOFT  040232 G        8960    8961#
LSSPC   002056 G        1320#
LSSPCP  002020 G        1290#
LSSPTP  002024 G        1294#
LSSTA   002030 G        1298#
LSSW    002236 G        1437    1438#
LSTEST  002114 G        1350#
LSTIML  002014 G        1286#
LSUNIT  002012 G        1284#
L10000  002234          1406    1428#
L10001  002236          1437    1441#
L10002  005220          2599#
L10003  005272          2633#
L10004  005302          2651#
L10005  005412          2682#
L10006  005424          2692#
L10007  005550          2732#
L10010  005646          2759#
L10011  006610          2966#
L10012  006722          2998#
L10013  007102          3056#
L10014  010022          3159#
L10015  011274          3321#
L10017  020172          3635#
L10020  020320          3695#
L10021  020344          3715#
L10022  020350          3730#
L10023  020352          3743#
L10024  020510          3807#
L10025  020640          3849#
L10026  021226          3912#
L10027  021420          4017#
L10030  021562          4100#
L10031  021704          4159#
L10032  022106          4236#
L10033  022616          4338    4390#
L10034  022326          4315#
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CVDMAA.P11 12-DEC-80 15:59 CROSS REFERENCE TABLE -- USER SYMBOLS

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L10035  022614          4387#
L10036  023164          4441    4500    4517    4533    4538#
L10037  023352          4566    4581    4615#
L10040  025112          4868    4895    4914    4943    4975    4988    5105#
L10041  025734          5225    5262    5283    5315    5336    5339#
L10042  026016          5364    5383    5393#
L10043  026012          5386#
L10044  026100          5419    5438    5448#
L10045  026074          5441#
L10046  026202          5475    5485    5504    5514#
L10047  026176          5507#
L10050  027246          5591    5604    5916#
L10051  026710          5768#
L10052  027066          5840#
L10053  027244          5912#
L10054  027330          5942    5961    5971#
L10055  027324          5964#
L10056  027412          5997    6016    6026#
L10057  027406          6019#
L10060  027476          6052    6071    6080#
L10061  027472          6074#
L10062  027564          6112    6132    6142#
L10063  027560          6135#
L10064  030052          6169    6184    6195    6203    6215    6240    6251    6264#
L10065  030202          6292    6306    6314    6332#
L10066  030332          6357    6371    6379    6397#
L10067  030466          6422    6439    6447    6464#
L10070  030616          6489    6503    6511    6529#
L10071  030746          6554    6568    6576    6594#
L10072  031104          6619    6635    6643    6661#
L10073  036056          6728    6737    6752    6761    6770    6779    6788    6813    6828    6837    6846    6867    6877
                        6887    6914    6926    6937    6946    6962    6974    6983    6992    7013    7023    7043    7052
                        7076    7085    7100    7115    7124    7141    7152    7175    7192    7226    7241    7250    7268
                        7283    7292    7314    7329    7338    7360    7375    7384    7393    7402    7426    7435    7454
                        7463    7472    7481    7490    7509    7525    7534    7557    7566    7575    7596    7605    7614
                        7623    7632    7645    7656    7671    7681    7693    7702    7723    7743    7752    7761    7770
                        7794    7803    7812    7821    7837    7853    7862    7871    7888    7900    7924    7941    7975
                        8000    8009    8024    8033    8067    8082    8104    8119    8128    8144    8159    8168    8177
                        8186    8195    8206#
L10074  033356          6742    6818    6855    6898    7001    7033    7061    7066    7105    7165    7207    7231    7273
                        7301    7319    7347    7365    7411#
L10075  036054          7443    7514    7543    7586    7711    7733    7779    7784    7842    7913    7956    7980    8014
                        8042    8050    8072    8091    8109    8149    8203#
L10076  040062          8376    8385    8435    8454    8474    8513    8538    8565    8575    8585    8654    8665    8726
                        8746    8788    8818    8827    8836    8845    8854    8875    8902#
L10077  037014          8390    8400    8414    8425    8440    8462    8479    8492    8503    8518    8528    8543    8553#
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L10102  040232          8960    8964#
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NPRGO = 000100          1545#
NPRIO = 000040          1546#  1556   1557
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OSAU  = 000001          1242#  1260#  1330
OSBGNR= 000000          1242#  1324
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OSDU  = 000001          1242#  1260#  1332
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OSGNSW= 000000          1242#  1.74
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PATC    002556          1869   1897#  5163   5164
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PATGEN  023750          4629   4677   4743#
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REG1     002422          1815#
REG2     002424          1816#
REG3     002426          1817#
REG4     002430          1818#
REG5     002432          1819#
REG6     002434          1820#
REG7     002436          1821#
RESFMC   003040          2048#  3888   3890   3902
RESFT3   003062          2048   2068#  3951   3987*  3994   4005
RESTRT   017740          3530   3564#
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SEL12    002376          1799#  2430
SEL14    002402          1802#  2431
SEL16    002406          1805#  2432
SEL2     002356          1787#  2426   4285   4287   4479   4487
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CVDMAA.P11 12-DEC-80 15:59 CROSS REFERENCE TABLE -- USER SYMBOLS

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8609	8622	8623	8628	8629	8630	8631	8633	8634	8642	8643	8647	8648
8649	8650	8652	8653	8662	8664	8665	8669	8670	8674	8675	8676	8677
8679	8680	8688	8689	8694	8695	8696	8697	8699	8700	8708	8709	8713
8714	8715	8716	8723	8725	8726	8733	8734	8743	8745	8746	8750	8751
8755	8756	8757	8758	8760	8761	8766	8767	8772	8773	8774	8775	8777
8778	8785	8787	8788	8792	8793	8797	8798	8799	8800	8802	8803	8807
8808	8815	8817	8818	8824	8826	8827	8833	8835	8836	8842	8844	8845
8851	8853	8854	8857	8858	8859	8860	8872	8874	8875	8879	8880	8884
8885	8886	8887	8889	8890	8896	8900	8903	8920	8924	8925	8926	8927
8929	8930	8931	8932	8934	8935	8936	8937	8938	8941	8960	8963	8977
8978	8979											
SVC SIR= 000001 1242#	1250#	4266	4319	5371	5426	5492	5613	5773	5845	5949	6004	6059
6120	6718	7418	8368	8557								
SW FLAG= 000001 1242#	1252#	1428	1441	2599	2633	2651	2682	2692	2732	2759	2966	2998
3056	3159	3321	3635	3695	3715	3730	3743	3807	3849	3912	4017	4100
4159	4236	4315	4387	4390	4538	4615	5105	5339	5386	5393	5441	5448
5507	5514	5760	5768	5832	5840	5904	5912	5916	5964	5971	6019	6026

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                    6074  6080  6135  6142  6264  6332  6397  6464  6529  6594  6661  7411  8203
                    8206  8553  8899  8902  8942  8964
SVCTST= 000001       1242# 1249# 3767  3875  3930  4037  4114  4174  4264  4411  4559  4861  5139
                     5357  5412  5468  5581  5935  5990  6045  6105  6161  6284  6349  6414  6481
                     6546  6611  6716  8366
SWPBOT= 121000       1577#
SWPDDC= 121400       1578#
S$LSYM= 010000       1242# 1429# 1442# 2600# 2634# 2652# 2683# 2693# 2733# 2760# 2967# 2999# 3057#
                     3160# 3322# 3636# 3696# 3716# 3731# 3744# 3808# 3850# 3913# 4018# 4101# 4160#
                     4237# 4316# 4388# 4391# 4539# 4616# 5106# 5340# 5387# 5394# 5442# 5449# 5508#
                     5515# 5623# 5769# 5790# 5841# 5862# 5913# 5917# 5965# 5972# 6020# 6027# 6075#
                     6081# 6136# 6143# 6265# 6333# 6398# 6465# 6530# 6595# 6662# 7412# 8204# 8207#
                     8554# 8900# 8903# 8943# 8965#
TDATA   002306       1719# 2547  5374* 5429* 5495* 5619* 5620  5629  5670* 5674  5693* 5700  5723
                     5736* 5740  5779* 5780  5796  5851* 5852  5868  5952* 6007* 6062* 6123* 6172*
                     6228* 6295* 6360* 6428* 6492* 6557* 6624*
TMPA    002464       1835# 3078  3190  4582* 4583  4597* 4598  4621* 4631  4679  4775  4925* 4934
                     4966  4979  5020  5022* 5027  5029  5040* 5059  5061* 5066  5068  5083*
TMPB    002466       1836# 2465* 2466* 2489  2492  2494* 2498  3212  3238  3284  3311  4922* 5037
                     5039* 5050* 5076  5078* 5091* 6782  6861  7448  7569
TMPC    002470       1837# 3200  4878* 5042  5051* 5080  5089*
TMPD    002472       1838# 3202  3309  4921* 5013  5053* 6968  7590  8153  8239  8247  8812
TMPE    002474       1839# 2480* 2484  3282  4768* 4583  4598  4875* 4902  5020  5083
TMPF    002476       1840# 3173  4622* 4656  4658* 4698  4700* 4877* 4951  4953* 4961* 4996  4998*
                     5007*
TMP0    002440       1825# 3670* 3688  3697* 4874* 4901  4903  5029  5068  6878* 6881  7014  8303
                     8311  8576* 8579
TMP1    002442       1826#
TMP2    002444       1827# 3007  4567* 4605* 4606  4636  4684  4744  4747  6868* 6871  7004* 7007
                     7548* 7551  7714* 7717  7991* 7994  8566* 8569
TMP3    002446       1828# 4620* 4638* 4686* 4750  4761  4768  4778  4781*
TMP4    002450       1829# 3068  3176  3180  3271  3298  4570* 4646  4654  4696  4755* 4758* 4763*
                     4765* 4770* 4772* 4775* 4778* 4917* 4926* 4949  4969  4994  5041* 5044* 5079*
                     5082* 6746  6822  6920  6927  7220  7369  7457  7599  7650  7657  7737  7788
                     7847  7969  8162  8221* 8225  8468  8740  8821
TMP5    002452       1830# 3069  3075  3181  3187  3273  3300  4571* 4651  4654  4693  4696  4937
                     4949  4982  4994  6755  6804* 6807  6931  6931  6956  6963  7094  7262  7351*
                     7354  7378  7466  7500* 7503  7519  7608  7675  7682  7746  7797  7831  8003
                     8018  8095* 8098  8138  8171  8222* 8228  8272* 8429  8659  8830
TMP6    002454       1831# 2463* 2503  3267  3294  6764  6940  6977  7037  7070  7109  7135  7142
                     7235  7277  7305* 7308  7323  7387  7475  7617  7687  7755  7806  7856  7882
                     7889  8058* 8061  8076  8113  8180  8504* 8507  8779* 8782  8839
TMP7    002456       1832# 2464* 2508  3269  3296  6773  6840  6986  7046  7079  7118  7146  7169
                     7186  7193  7244  7286  7332  7396  7484  7528  7626  7696  7764  7815  7865
                     7894  7918  7935  7942  8027  8122  8189  8267  8271  8272  8529* 8532  8848
                     8866* 8869
TMP8    002460       1833#
TMP9    002462       1834# 3209  4876*
TXTMLT  017532       2720  3494#
TXTML0  014105       3494#
TXTML1  014111       3494#
TXTML2  014125       3494#
TXTML3  014142       3494#
TXTML4  014164       3494#
TXTML5  014205       3494#
TXTML6  014235       3096  3494#
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CVDMAA.P11 12-DEC-80 15:59 CROSS REFERENCE TABLE -- USER SYMBOLS

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TXTVR   014327          2977    3494#
TXTVRA  014425          3494#
TXTVRB  014430          3494#
TXTVRC  014434          3494#
TXTVRD  014440          3494#
TXTVRE  014444          3494#
TXTVRF  014450          3494#
TXTVRT  017554          2976    3494#
TXTVR0  014345          3494#
TXTVR1  014351          3494#
TXTVR2  014355          3494#
TXTVR3  014362          3494#
TXTVR4  014367          3494#
TXTVR5  014374          3494#
TXTVR6  014401          3494#
TXTVR7  014406          3494#
TXTVR8  014413          3494#
TXTVR9  014420          3494#
TXT1    013253          3350    3494#
TXT2    013311          3372    3494#
TXT2A   013353          3393    3494#
TXT2B   013412          3414    3494#
TXT3    013454          3351    3494#
TXT4    013504          3442    3494#
TXT4A   013544          3460    3494#
TXT47C  007442          3094#   3096
TXT47D  007453          3094#   3096
TXT47E  007466          3094#   3096
TXT47F  007510          3094#   3096
TXT47G  007533          3094#   3096
TXT47H  007[illegible]6 3094#   3096
TXT47P  007614          3013    3096#
TXT48A  010736          3175    3228#
TXT48B  010743          3179    3228#
TXT48C  010750          3204    3228#
TXT48D  010755          3206    3228#
TXT5    013605          2660    2741    3494#
TXT6    013607          3443    3494#
TXT7    013632          2770    3494#
TXT7A   013717          2868    3494#
TXT8A   014004          2789    2887    3494#
TXT8B   014021          2819    2917    3494#
TXT8C   014036          2849    2947    3494#
TXT8D   014053          3274    3494#
TXT8E   014070          3301    3494#
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                        2727    2740#   2746    2749#   2756    2770#   2775    2777#   2794    2796#   2804    2807#   2824
                        2826#   2834    2837#   2854    2856#   2864    2868#   2873    2875#   2892    2894#   2902    2905#
                        2922    2924#   2932    2935#   2952    2954#   2962    2976#   2982    2985#   2995    3015#   3020
                        3024#   3028    3032#   3036    3040#   3044    3048#   3052    3072#   3083    3087#   3091    3110#
                        3114    3118#   3122    3126#   3130    3135#   3139    3143#   3147    3151#   3155    3184#   3196
                        3208#   3217    3221#   3225    3249#   3254    3258#   3262    3266#   3279    3281#   3289    3293#
                        3306    3308#   3316    3350#   3356    3358#   3370    3372#   3377    3379#   3391    3393#   3398
                        3400#   3412    3414#   3419    3421#   3433    3442#   3448    3450#   3458    3460#   3465    3467#
                        3475    3483#   3487    3822#   3827    3829#   3833    3835#   3839    3841#   3847    6796#   6800
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TSCOLE= 002032
TSERRN= 000146

1242# 2588# 2622# 3803# 3908# 4013# 4086# 4154# 4218# 4231# 4311# 4333# 4383#
4436# 4495# 4512# 4528# 4957# 5002# 5220# 5257# 5278# 5310# 5331# 5643# 5664#
5687# 5713# 5730# 5753# 5809# 5825# 5881# 5897# 6223# 6259# 6327# 6392# 6459#
6524# 6589# 6656# 6792# 6850# 6903# 6950# 6996# 7056# 7089# 7128# 7156# 7179#
7198# 7212# 7254# 7296# 7342# 7406# 7494# 7538# 7636# 7662# 7706# 7774# 7825#
7875# 7904# 7928# 7947# 7961# 7985# 8037# 8055# 8086# 8132# 8199# 8395# 8420#
8445# 8484# 8498# 8523# 8548# 8604# 8629# 8648# 8675# 8695# 8714# 8756# 8773#
8798# 8858# 8885#

TSEXCP= 000000
TSFLAG= 000040

8924# 9928 8929# 8933 8934# 8939
4337# 4440# 4499# 4516# 4532# 4565# 4580# 4857# 4894# 4913# 4942# 4974# 4987#
5224# 5261# 5282# 5314# 5335# 5363# 5382# 5418# 5437# 5474# 5484# 5503# 5590#
5603# 5941# 5960# 5996# 6015# 6051# 6070# 6111# 6131# 6168# 6183# 6194# 6202#
6214# 6239# 6250# 6291# 6305# 6313# 6356# 6370# 6378# 6421# 6438# 6446# 6488#
6502# 6510# 6553# 6567# 6575# 6618# 6634# 6642# 6727# 6736# 6741# 6751# 6760#
6769# 6778# 6787# 6812# 6817# 6827# 6836# 6845# 6854# 6866# 6876# 6886# 6897#
6913# 6925# 6936# 6945# 6961# 6973# 6982# 6991# 7000# 7012# 7022# 7032# 7042#
7051# 7060# 7065# 7075# 7084# 7099# 7104# 7114# 7123# 7140# 7151# 7164# 7174#
7191# 7206# 7225# 7230# 7240# 7249# 7267# 7272# 7282# 7291# 7300# 7313# 7318#
7328# 7337# 7346# 7359# 7364# 7374# 7383# 7392# 7401# 7425# 7434# 7442# 7453#
7462# 7471# 7480# 7489# 7508# 7513# 7524# 7533# 7542# 7556# 7565# 7574# 7585#
7595# 7604# 7613# 7622# 7631# 7644# 7655# 7670# 7680# 7692# 7701# 7710# 7722#
7732# 7742# 7751# 7760# 7769# 7778# 7783# 7793# 7802# 7811# 7820# 7836# 7841#
7852# 7861# 7870# 7887# 7899# 7912# 7923# 7940# 7955# 7974# 7979# 7999# 8008#
8013# 8023# 8032# 8041# 8049# 8066# 8071# 8081# 8090# 8103# 8109# 8118# 8127#
8143# 8148# 8158# 8167# 8176# 8185# 8194# 8375# 8384# 8389# 8399# 8413# 8424#
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8564# 8574# 8584# 8593# 8598# 8608# 8622# 8633# 8642# 8652# 8664# 8669# 8679#
8688# 8699# 8708# 8725# 8733# 8745# 8750# 8760# 8766# 8777# 8787# 8792# 8802#
8807# 8817# 8826# 8835# 8844# 8853# 8874# 8879# 8889#

TSGMAN= 000000
TSHILI= 000007
TSLAST= 000001
TSLOLI= 000000
TSLSYM= 010000

1242#
8924# 8927 8929# 8932 8934# 8938
1242# 8978#
8924# 8926 8929# 8931 8934# 8937
1242# 1429 1442 2600 2634 2652 2683 2693 2733 2760 2967 2999 3057
3160 3322 3636 3696 3716 3731 3744 3808 3850 3913 4018 4101 4160
4237 4316 4388 4391 4539 4616 5106 5340 5387 5394 5442 5449 5508
5515 5769 5841 5913 5917 5965 5972 6020 6027 6075 6081 6136 6143
6265 6333 6398 6465 6530 6595 6662 7412 8204 8207 8554 8900 8903
8943 8965

TSLTNO= 000034
TSNEST= 177777

8981#
1242# 1244# 1406# 1428# 1437# 1441# 2580# 2599# 2614# 2633# 2648# 2651# 2657#
2682# 2688# 2692# 2698# 2732# 2738# 2759# 2765# 2966# 2972# 2998# 3004# 3056#
3106# 3159# 3236# 3321# 3503# 3508# 3516# 3635# 3662# 3695# 3707# 3715# 3725#
3730# 3741# 3743# 3768# 3807# 3820# 3849# 3876# 3912# 3931# 4017# 4038# 4100#
4115# 4159# 4175# 4236# 4265# 4267# 4315# 4320# 4387# 4390# 4412# 4538# 4560#
4615# 4862# 5105# 5140# 5339# 5358# 5372# 5386# 5393# 5413# 5427# 5441# 5448#
5469# 5493# 5507# 5514# 5582# 5614# 5623# 5760# 5768# 5774# 5790# 5832# 5840#
5846# 5862# 5904# 5912# 5916# 5936# 5950# 5964# 5971# 5991# 6005# 6019# 6026#
6046# 6060# 6074# 6080# 6106# 6121# 6135# 6142# 6162# 6264# 6285# 6332# 6350#
6367# 6415# 6464# 6482# 6529# 6547# 6594# 6612# 6661# 6717# 6719# 7411# 7419#
8203# 8206# 8367# 8369# 8553# 8558# 8899# 8902# 8920# 8941# 8960# 8963# 8976#

TSNS0 = 000000
TSNS1 = 000005

1244#
1406# 1428 1437# 1441 2580# 2599 2614# 2633 2648# 2651 2657# 2682 2688#
2692 2698# 2732 2738# 2759 2765# 2966 2972# 2998 3004# 3056 3106# 3159
3236# 3321 3503# 3508 3516# 3635 3662# 3695 3707# 3715 3725# 3730 3741#

T$NS2 = 000002
T$NS3 = 000003
T$PTNU= 000000
T$SAVL= 177777
T$SEGL= 177777
T$SEKO= 010000
T$SUBN= 000002
T$TAGL= 177777
T$TAGN= 010103
T$TEMP= 000000

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                7923#   7924    7940#   7941    7955#   7956    7974#   7975    7979#   7980    7999#   8000    8008#
                8009    8013#   8014    8023#   8024    8032#   8033    8041#   8042    8049#   8050    8066#   8067
                8071#   8072    8081#   8082    8090#   8091    8103#   8104    8108#   8109    8118#   8119    8127#
                8128    8143#   8144    8148#   8149    8158#   8159    8167#   8168    8176#   8177    8185#   8186
                8194#   8195    8203#   8206#   8375#   8376    8384#   8385    8389#   8390    8399#   8400    8413#
                8414    8424#   8425    8434#   8435    8439#   8440    8453#   8454    8461#   8462    8473#   8474
                8478#   8479    8491#   8492    8502#   8503    8512#   8513    8517#   8518    8527#   8528    8537#
                8538    8542#   8543    8553#   8564#   8565    8574#   8575    8584#   8585    8593#   8594    8598#
                8599    8608#   8609    8622#   8623    8633#   8634    8642#   8643    8652#   8653    8664#   8665
                8669#   8670    8679#   8680    8688#   8689    8699#   8700    8708#   8709    8725#   8726    8733#
                8734    8745#   8746    8750#   8751    8760#   8761    8766#   8767    8777#   8778    8787#   8788
                8792#   8793    8802#   8803    8807#   8808    8817#   8818    8826#   8827    8835#   8836    8844#
                8845    8853#   8854    8874#   8875    8879#   8880    8889#   8890    8899#   8902#   8924#   8929#
                8934#   8941#   8963#   8976#
TSTEST= 000034  1242#   3767#   3875#   3930#   4037#   4114#   4174#   4264#   4266    4319    4411#   4559#   4861#
                5139#   5357#   5371    5412#   5426    5468#   5492    5581#   5613    5773    5845    5935#   5949
                5990#   6004    6045#   6059    6105#   6120    6161#   6284#   6349#   6414#   6481#   6546#   6611#
                6716#   6718    7418    8366#   8368    8557    8981
TSTSTM= 177777  1242#   2587    2621    2652    2664    2677    2683    2693    2709    2726    2733    2745    2755
                2760    2774    2793    2803    2823    2833    2853    2863    2872    2891    2901    2921    2931
                2951    2961    2967    2981    2994    2999    3019    3027    3035    3043    3051    3057    3082
                3090    3113    3121    3129    3138    3146    3154    3160    3195    3216    3224    3253    3261
                3278    3288    3305    3315    3322    3355    3369    3376    3390    3397    3411    3418    3432
                3447    3457    3464    3474    3486    3522    3528    3534    3540    3557    3562    3580    3620
                3628    3636    3668    3687    3692    3696    3710    3713    3716    3728    3731    3744    3776
                3795    3802    3808    3826    3832    3838    3846    3850    3882    3907    3913    4012    4018
                4044    4085    4101    4123    4139    4153    4160    4186    4194    4217    4230    4237    4267
                4271    4310    4316    4320    4332    4337    4382    4388    4391    4416    4426    4435    4440
                4494    4499    4511    4516    4527    4532    4539    4563    4565    4578    4580    4586    4596
                4601    4613    4616    4865    4867    4892    4894    4911    4913    4933    4940    4942    4956
                4972    4974    4985    4987    5001    5103    5106    5143    5151    5158    5176    5191    5219
                5224    5234    5241    5248    5256    5261    5270    5277    5282    5290    5297    5309    5314
                5322    5330    5335    5340    5361    5363    5372    5380    5382    5387    5394    5416    5418
                5427    5435    5437    5442    5449    5472    5474    5482    5484    5493    5501    5503    5508
                5515    5588    5590    5601    5603    5614    5623    5642    5663    5686    5712    5729    5752
                5761    5769    5774    5790    5808    5824    5833    5841    5846    5862    5880    5896    5905
                5913    5917    5939    5941    5950    5958    5960    5965    5972    5994    5996    6005    6013
                6015    6020    6027    6049    6051    6060    6068    6070    6075    6081    6109    6111    6121
                6129    6131    6136    6143    6166    6168    6181    6183    6192    6194    6200    6202    6212
                6214    6222    6237    6239    6248    6250    6258    6265    6289    6291    6303    6305    6311
                6313    6326    6333    6354    6356    6368    6370    6376    6378    6391    6398    6419    6421
                6436    6438    6444    6446    6458    6465    6486    6488    6500    6502    6508    6510    6523
                6530    6551    6553    6565    6567    6573    6575    6588    6595    6616    6618    6632    6634
                6640    6642    6655    6662    6719    6725    6727    6734    6736    6741    6749    6751    6758
                6760    6767    6769    6776    6778    6785    6787    6791    6799    6810    6812    6817    6825
                6827    6834    6836    6843    6845    6849    6854    6864    6866    6874    6876    6884    6886
                6897    6902    6911    6913    6923    6925    6934    6936    6943    6945    6949    6959    6961
                6971    6973    6980    6982    6989    6991    6995    7000    7010    7012    7020    7022    7032
                7040    7042    7049    7051    7055    7060    7065    7073    7075    7082    7084    7088    7097
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                7172    7174    7178    7189    7191    7197    7206    7211    7223    7225    7230    7238    7240
                7247    7249    7253    7265    7267    7272    7280    7282    7289    7291    7295    7300    7311
                7313    7318    7326    7328    7335    7337    7341    7346    7357    7359    7364    7372    7374
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```
                    7442  7451  7453  7460  7462  7469  7471  7478  7480  7487  7489  7493  7506
                    7508  7513  7522  7524  7531  7533  7537  7542  7554  7556  7563  7565  7572
                    7574  7585  7593  7595  7602  7604  7611  7613  7620  7622  7629  7631  7635
                    7642  7644  7653  7655  7661  7668  7670  7678  7680  7690  7692  7699  7701
                    7705  7710  7720  7722  7732  7740  7742  7749  7751  7758  7760  7767  7769
                    7773  7778  7783  7791  7793  7800  7802  7809  7811  7818  7820  7824  7834
                    7836  7841  7850  7852  7859  7861  7868  7870  7874  7885  7887  7897  7899
                    7903  7912  7921  7923  7927  7938  7940  7946  7955  7960  7972  7974  7979
                    7984  7997  7999  8006  8008  8013  8021  8023  8030  8032  8036  8041  8049
                    8054  8064  8066  8071  8079  8081  8085  8090  8101  8103  8108  8116  8118
                    8125  8127  8131  8141  8143  8148  8156  8158  8165  8167  8174  8176  8183
                    8185  8192  8194  8198  8204  3207  8242  8306  8369  8373  8375  8382  8384
                    8389  8394  8399  8413  8419  8424  8432  8434  8439  8444  8451  8453  8461
                    8471  8473  8478  8483  8491  8497  8502  8510  8512  8517  8522  8527  8535
                    8537  8542  8547  8554  8558  8562  8564  8572  8574  8582  8584  8591  8593
                    8598  8603  8608  8622  8628  8633  8642  8647  8652  8662  8664  8669  8674
                    8679  8688  8694  8699  8708  8713  8723  8725  8733  8743  8745  8750  8755
                    8760  8766  8772  8777  8785  8787  8792  8797  8802  8807  8815  8817  8824
                    8826  8833  8835  8842  8844  8851  8853  8857  8872  8874  8879  8884  8889
                    8896  8900  8903
T$TSTS= 000001       1242# 3768# 3876# 3931# 4038# 4115# 4175# 4265# 4412# 4560# 4862# 5140# 5358#
                    5413# 5469# 5582# 5936# 5991# 6046# 6106# 6162# 6285# 6350# 6415# 6482# 6547#
                    6612# 6717# 8367#
T$$AU = 010023       3741# 3743
T$$AUT= 010020       3662# 3695
T$$CLE= 010021       3707# 3715
T$$DU = 010022       3725# 3730
T$$HAR= 010101       8920# 8942
T$$HU = 010000       1406# 1428
T$$INI= 010017       3516# 3635
T$$MSG= 010025       2648# 2651  2657# 2682  2688# 2692  2698# 2732  2738# 2759  2765# 2966  2972#
                    2998  3004# 3056  3106# 3159  3236# 3321  3820# 3849
T$$PRO= 010016       3503#
T$$SEG= 010000       5623# 5760# 5790# 5832# 5862# 5904#
T$$SOF= 010102       8960# 8964
T$$SRV= 010003       2580# 2599  2614# 2633
T$$SUB= 010100       4267# 4315  4320# 4387  5372# 5386  5427# 5441  5493# 5507  5614# 5768  5774#
                    5840  5846# 5912  5950# 5964  6005# 6019  6060# 6074  6121# 6135  6719# 6741
                    6817  6854  6897  7000  7032  7060  7065  7104  7164  7206  7230  7272  7300
                    7318  7346  7364  7411  7419# 7442  7513  7542  7585  7710  7732  7778  7783
                    7841  7912  7955  7979  8013  8041  8049  8071  8090  8108  8148  8203  8369#
                    8389  8399  8413  8424  8439  8461  8478  8491  8502  8517  8527  8542  8553
                    8558# 8598  8608  8622  8633  8642  8652  8669  8679  8688  8699  8708  8733
                    8750  8760  8766  8777  8792  8802  8807  8879  8889  8899
T$$SW = 010001       1437# 1441
T$$TES= 010076       3768# 3807  3876# 3912  3931# 4017  4038# 4100  4115# 4159  4175# 4236  4265#
                    4337  4390  4412# 4440  4499  4516  4532  4538  4560# 4565  4580  4615  4862#
                    4867  4894  4913  4942  4974  4987  5105  5140# 5224  5261  5282  5314  5335
                    5339  5358# 5363  5382  5393  5413# 5418  5437  5448  5469# 5474  5484  5503
                    5514  5582# 5590  5603  5916  5936# 5941  5960  5971  5991# 5996  6015  6026
                    6046# 6051  6070  6080  6106# 6111  6131  6142  6162# 6168  6183  6194  6202
                    6214  6239  6250  6264  6285# 6291  6305  6313  6332  6350# 6356  6370  6378
                    6397  6415# 6421  6438  6446  6464  6482# 6488  6502  6510  6529  6547# 6553
                    6567  6575  6594  6612# 6618  6634  6642  6661  6717# 6727  6736  6751  6760
                    6769  6778  6787  6812  6827  6836  6845  6866  6876  6886  6913  6925  6936
                    6945  6961  6973  6982  6991  7012  7022  7042  7051  7075  7084  7099  7114
```

```
                        7123   7140   7151   7174   7191   7225   7240   7249   7267   7282   7291   7313   7328
                        7337   7359   7374   7383   7392   7401   7425   7434   7453   7462   7471   7480   7489
                        7508   7524   7533   7556   7565   7574   7595   7604   7613   7622   7631   7644   7655
                        7670   7680   7692   7701   7722   7742   7751   7760   7769   7793   7802   7811   7820
                        7836   7852   7861   7870   7887   7899   7923   7940   7974   7999   8008   8023   8C32
                        8066   8081   8103   8118   8127   8143   8158   8167   8176   8185   8194   8206   8367#
                        8375   8384   8434   8453   8473   8512   8537   8564   8574   8584   8593   8664   8725
                        8745   8787   8817   8826   8835   8844   6853   8874   8902
T.EDF  = 000001         1670#  2192   2232   2272   2315   2378   2563   4661   4703   8281
T.EHRD= 000002          1670#
T.ESF  = 000000         1670#
T.ESFT= 000003          1670#
T1      020354 G        1368   3767#
T1CH   = 120005         1644#  5699   5720   6754   6806   6830   6930   6955   7093   7261   7353   7377   7465
                        7502   7518   7607   7674   7745   7796   7830   8002   8017   8097   8137   8170   8227
                        8270   8428   8658   8829
T1CL   = 120004         1643#  5628   5650   5655   5858   6745   6821   6919   7219   7368   7456   7598   7649
                        7736   7787   7846   7968   8161   8224   8467   8739   8820
T1LH   = 120007         1647#  2507   5154   5705   5739   5745   5786   5816   5867   5873   6772   6839   6985
                        7045   7078   7117   7145   7168   7185   7243   7285   7331   7395   7483   7527   7625
                        7695   7763   7814   7864   7893   7917   7934   8026   8121   8188   8266   8531   8847
                        8868
T1LHGO= 120005          1645#
T1LL   = 120006         1646#  2502   5147   5635   5673   5679   5696   5795   5801   5888   6763   6939   6976
                        7036   7069   7108   7134   7234   7276   7307   7322   7386   7474   7616   7686   7754
                        7805   7855   7881   8060   8075   8112   8179   8506   8781   8838
T1.EHD  020642          3804   3852#
T1.EM1  020524 G        3805   3820#
T1.HIT  020512          3773   3810#
T1.HSB  020522          3783*  3798   3816#  3841
T1.HSW  020520          3768*  3783   3784*  3796   3810*  3813#  3842
T1.OK   020510          3799   3806#
T1.1    020671          3823   3852#
T1.2    020753          3829   3852#
T1.3    021006          3835   3852#
T1.4    021060          3843   3852#
T10     024134 G        1377   4861#
T11     025114 G        1378   5139#
T12     025736 G        1379   5357#
T12.LP  025760          5369#  5389
T12.1   025760          5371#
T13     026020 G        1380   5412#
T13.LP  026042          5424#  5444
T13.1   026042          5426#
T14     026102 G        1381   5468#
T14.LP  026144          5490#  5510
T14.1   026144          5492#
T15     026204 G        1382   5581#
T15.1   026240          5613#
T15.2   026712          5773#
T15.3   027070          5845#
T16     027250 G        1383   5935#
T16.LP  026250          5618#  5764
T16.L1  026722          5778#  5836
T16.L2  027100          5850#  5908
T16.1   027272          5949#
```

CVDMAA.P11 12-DEC-80 15:59 CROSS REFERENCE TABLE -- USER SYMBOLS

```
T17      027332 G          1384    5990#
T17.1    027354            6004#
T18      027414 G          1385    6045#
T18.LP   027272            5947#   5967
T18.1    027440            6059#
T19      027500 G          1386    6105#
T19.LP   027354            6002#   6022
T19.1    027526            6120#
T2       021120 G          1369    3875#
T2CH   = 120011            1650#
T2CL   = 120010            1649#
T2LL   = 120010            1648#   1649
T20      027566 G          1387    6161#
T20.LP   027440            6057#   6077
T21      030054 G          1388    6284#
T21.LP   027526            6118#   6138
T22      030204 G          1389    6349#
T23      030334 G          1390    6414#
T24      030470 G          1391    6481#
T25      030620 G          1392    6546#
T26      030750 G          1393    6611#
T27      031106 G          1394    6716#
T27.1    031106            6718#
T27.2    033360            7418#
T28      036332 G          1395    8366#
T28.1    036332            8368#
T28.2    037016            8557#
T3       021230 G          1370    3930#
T4       021422 G          1371    4037#
T5       021564 G          1372    4114#
T6       021706 G          1373    4174#
T7       022110 G          1374    4264#
T7.1     022110            4266#
T7.2     022330            4319#
T8       022620 G          1375    4411#
T9       023166 G          1376    4559#
T9.RST   023354            4569    4592    4620#
UAM    = 000200 G          1510#
VECTOR   040146            8930    8944#
WA     = 003346            2088#   2089
WB     = 003350            2089#   2090
WC     = 003352            2090#   2091
WD     = 003354            2091#   2092
WE     = 003356            2092#   2093
WF     = 003360            2093#
WRCRAM   023372            4575    4627#
WRILOC=  000002            1607#   2365    2375    4322    4447    8274
WRIPAG=  000004            1609#
WRITE    004310            2342#   2482    2496    2501    2506    2545    4644    4967    5627    5672    5698    5738    5794
                           5866    6805    6869    6879    7005    7260    7306    7352    7501    7549    7715    7992    8001
                           8059    8096    8136    8223    8226    8505    8530    8567    8577    8780    8867
WRITEI   004322            2362#   4421    4608    4887    4906    5098    5146    5153    5170    5236    5285    5292    5477
                           5695    5785    5857    6424    7015
WSR0     002246            1691#   2425*   3453    4345    4349
WSR10    002256            1699#   2429*   3470
WSR12    002260            1701#   2430*   3469
```

CROSS REFERENCE TABLE -- USER SYMBOLS

```
WSR14    002262          1703#  2431*  3468
WSR16    002264          1705#  2432*  3467
WSR2     002250          1693#  2426*  3452   4353   4358
WSR4     002252          1695#  2427*  3451   4363   4367
WSR6     002254          1697#  2428*  3450   4371   4374
W0     = 003322          2078#  2079
W1     = 003324          2079#  2080
W2     = 003326          2080#  2081
W3     = 003330          2081#  2082
W4     = 003332          2082#  2083
W5     = 003334          2083#  2084
W6     = 003336          2084#  2085
W7     = 003340          2085#  2086
W8     = 003342          2086#  2087
W9     = 003344          2087#  2088
XDATA    002314          1722#  2669   2749   2986   3338*  3339*
XORGB    011276          2666   2747   2983   3336#
X$ALWA= 000000           1242#
X$FALS= 000040           1242#
X$OFFS= 000400           1242#
X$TRUE= 000020           1242#
$E     = 000146          1670#  2191#  2231#  2271#  2314#  2377#  2562#  2586#  2620#  3801#  3906#  4011#  4084#
                         4152#  4216#  4229#  4309#  4331#  4381#  4434#  4493#  4510#  4526#  4660#  4702#  4955#
                         5000#  5218#  5255#  5276#  5308#  5329#  5641#  5662#  5685#  5711#  5728#  5751#  5807#
                         5823#  5879#  5895#  6221#  6257#  6325#  6390#  6457#  6522#  6587#  6654#  6790#  6848#
                         6901#  6948#  6994#  7054#  7087#  7126#  7154#  7177#  7196#  7210#  7252#  7294#  7340#
                         7404#  7492#  7536#  7634#  7660#  7704#  7772#  7823#  7873#  7902#  7926#  7945#  7959#
                         7983#  8035#  8053#  8084#  8130#  8197#  8280#  8393#  8418#  8443#  8482#  8496#  8521#
                         8546#  8602#  8627#  8646#  8673#  8693#  8712#  8754#  8771#  8796#  8856#  8883#
$LSTIN= 000001           1246#
$LSTTA= 000001           1247#
$MPCSR= 160000 G         1779#  1784   1785   1787   1788   1790   1791   1793   1794   1796   1797   1799   1800
                         1802   1803   1805   1806
$T     = 000034          1670#  3745#  3854#  3914#  4019#  4102#  4161#  4238#  4392#  4540#  4785#  5109#  5341#
                         5395#  5450#  5516#  5918#  5973#  6028#  6082#  6144#  6266#  6334#  6399#  6466#  6531#
                         6596#  6664#  8316#
.      = 040344          1238#  1896#  2068#  2072#  2113#  2129#  2203#  3095#  3853#  4338   4441   4500   4517
                         4533   4566   4581   4611   4868   4890   4895   4909   4914   4938   4943   4970   4975
                         4983   4988   5101   5225   5262   5283   5315   5336   5364   5383   5419   5438   5475
                         5485   5504   5591   5599   5604   5942   5961   5997   6016   6052   6071   6112   6132
                         6169   6184   6195   6203   6215   6240   6251   6292   6306   6314   6357   6371   6379
                         6422   6439   6447   6489   6503   6511   6554   6568   6576   6619   6635   6643   6728
                         6732   6737   6739   6742   6747   6752   6756   6761   6765   6770   6774   6779   6783
                         6788   6808   6813   6815   6818   6823   6828   6832   6837   6841   6846   6855   6862
                         6867   6872   6877   6882   6887   6895   6898   6909   6914   6921   6926   6932   6937
                         6941   6946   6957   6962   6969   6974   6978   6983   6987   6992   7001   7008   7013
                         7018   7023   7030   7033   7038   7043   7047   7052   7061   7063   7066   7071   7076
                         7080   7085   7095   7100   7102   7105   7110   7115   7119   7124   7136   7141   7147
                         7152   7162   7165   7170   7175   7187   7192   7204   7207   7221   7226   7228   7231
                         7236   7241   7245   7250   7263   7268   7270   7273   7278   7283   7287   7292   7301
                         7309   7314   7316   7319   7324   7329   7333   7338   7347   7355   7360   7362   7365
                         7370   7375   7379   7384   7388   7393   7397   7402   7426   7430   7435   7440   7443
                         7449   7454   7458   7463   7467   7472   7476   7481   7485   7490   7504   7509   7511
                         7514   7520   7525   7529   7534   7543   7552   7557   7561   7566   7570   7575   7583
                         7586   7591   7596   7600   7605   7609   7614   7618   7623   7627   7632   7640   7645
                         7651   7656   7671   7676   7681   7688   7693   7697   7702   7711   7718   7723   7730
```

7733	7738	7743	7747	7752	7756	7761	7765	7770	7779	7781	7784	7789
7794	7798	7803	7807	7812	7816	7821	7832	7837	7842	7848	7853	7857
7862	7866	7871	7883	7888	7895	7900	7910	7913	7919	7924	7936	7941
7953	7956	7970	7975	7980	7995	8000	8004	8009	8011	8014	8019	8024
8028	8033	8042	8047	8050	8062	8067	8069	8072	8077	8082	8091	8099
8104	8106	8109	8114	8119	8123	8128	8139	8144	8146	8149	8154	8159
8163	8168	8172	8177	8181	8186	8190	8195	8376	8380	8385	8387	8390
8400	8411	8414	8425	8430	8435	8437	8440	8449	8454	8459	8462	8469
8474	8476	8479	8489	8492	8503	8508	8513	8515	8518	8528	8533	8538
8540	8543	8565	8570	8575	8580	8585	8589	8594	8596	8599	8609	8620
8623	8634	8640	8643	8653	8660	8665	8667	8670	8680	8686	8689	8700
8706	8709	8721	8726	8731	3734	8741	8746	8748	8751	8761	8764	8767
8778	8783	8788	8790	8793	8803	8805	8808	8813	8818	8822	8827	8831
8836	8840	8845	8849	8854	8870	8875	8877	8880	8890	8894	8967#	

CVDMAA.P11 12-DEC-80 15:59 CROSS REFERENCE TABLE -- MACRO NAMES

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BCOMPL      1#  1242#  3523  3529  3535  3541  3582
BERROR      1#  1242#
BGNAU       1#  1242#  3740
BGNAUT      1#  1242#  3661
BGNCLN      1#  1242#  3706
BGNDU       1#  1242#  3724
BGNHRD      1#  1242#  8919
BGNHW       1#  1242#  1405
BGNINI      1#  1242#  3515
BGNMOD      1#  1242#  1243
BGNMSG      1#  1242#  2647  2656  2687  2697  2737  2764  2971  3003  3105  3235  3819
BGNPRO      1#  1242#  3502
BGNPTA      1#  1242#
BGNRPT      1#  1242#
BGNSEG      1#  1242#  5622  5789  5861
BGNSET      1#  1242#
BGNSFT      1#  1242#  8959
BGNSRV      1#  1242#  2579  2613
BGNSUB      1#  1242#  4265  4318  5370  5425  5491  5612  5772  5844  5948  6003  6058  6119  6717
         7417   8367   8556
BGNSW       1#  1242#  1436
BGNTST      1#  1242#  3767  3875  3930  4037  4114  4174  4264  4411  4559  4861  5139  5357  5412
         5468   5581   5935  5990  6045  6105  6161  6284  6349  6414  6481  6546  6611  6716  8366
BNCOMP      1#  1242#
BNERRO      1#  1242#
BREAK       1#  1242#  4585  4600  4932
BRESET      1#  1242#  3727  4193
CKLOOP      1#  1242#
CLOCK       1#  1242#
CLOSE       1#  1242#
CLRVEC      1#  1242#  3560  3685  3708  3711  3793
COMMEN      1#  1242#
DELAY       1#  1242#
DESCRI      1#  1242#  2120
DEVTYP      1#  1242#  2108
DISPAT      1#  1242#  1365
DISPLA      1#  1242#
DOCLN       1#  1242#
DODU        1#  1242#  3690
DORPT       1#  1242#
ENDAU       1#  1242#  3742
ENDAUT      1#  1242#  3694
ENDCLN      1#  1242#  3714
ENDCOM      1#  1242#
ENDDU       1#  1242#  3729
ENDHRD      1#  1242#  8940
ENDHW       1#  1242#  1427
ENDINI      1#  1242#  3634
ENDMOD      1#  1242#  8975
ENDMSG      1#  1242#  2650  2681  2691  2731  2758  2965  2997  3055  3158  3320  3848
ENDPRO      1#  1242#  3507
ENDPTA      1#  1242#
ENDRPT      1#  1242#
ENDSEG      1#  1242#  5759  5831  5903
ENDSET      1#  1242#
ENDSFT      1#  1242#  8962
```

```
                5752#  5808#  5824#  5880#  5896#  6222#  6258#  6326#  6391#  6458#  6523#  6588#  6655#  6791#  6849#
                6902#  6949#  6995#  7055#  7088#  7127#  7155#  7178#  7197#  7211#  7253#  7295#  7341#  7405#  7493#
                7537#  7635#  7661#  7705#  7773#  7824#  7874#  7903#  7927#  7946#  7960#  7984#  8036#  8054#  8085#
                8131#  8198#  8394#  8419#  8444#  8483#  8497#  8522#  8547#  8603#  8628#  8647#  8674#  8694#  8713#
                8755#  8772#  8797#  8857#  8884#
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	6305#	6311#	6313#	6326#	6333#	6354#	6356#	6368#	6370#	6376#	6378#	6391#	6398#	6419#	6421#
	6436#	6438#	6444#	6446#	6458#	6465#	6486#	6488#	6500#	6502#	6508#	6510#	6523#	6530#	6551#
	6553#	6565#	6567#	6573#	6575#	6588#	6595#	6616#	6618#	6632#	6634#	6640#	6642#	6655#	6662#
	6719#	6725#	6727#	6734#	6736#	6741#	6749#	6751#	6758#	6760#	6767#	6769#	6776#	6778#	6785#
	6787#	6791#	6799#	6810#	6812#	6817#	6825#	6827#	6834#	6836#	6843#	6845#	6849#	6854#	6864#
	6866#	6874#	6876#	6884#	6886#	6897#	6902#	6911#	6913#	6923#	6925#	6934#	6936#	6943#	6945#
	6949#	6959#	6961#	6971#	6973#	6980#	6982#	6989#	6991#	6995#	7000#	7010#	7012#	7020#	7022#
	7032#	7040#	7042#	7049#	7051#	7055#	7060#	7065#	7073#	7075#	7082#	7084#	7088#	7097#	7099#
	7104#	7112#	7114#	7121#	7123#	7127#	7138#	7140#	7149#	7151#	7155#	7164#	7172#	7174#	7178#
	7189#	7191#	7197#	7206#	7211#	7223#	7225#	7230#	7238#	7240#	7247#	7249#	7253#	7265#	7267#

```
                7874#  7885#  7887#  7897#  7899#  7903#  7912#  7921#  7923#  7927#  7938#  7940#  7946#  7955#  7960#
                7972#  7974#  7979#  7984#  7997#  7999#  8006#  8008#  8013#  8021#  8023#  8030#  8032#  8036#  8041#
                8049#  8054#  8064#  8066#  8071#  8079#  8081#  8085#  8090#  8101#  8103#  8108#  8116#  8118#  8125#
                8127#  8131#  8141#  8143#  8148#  8156#  8158#  8165#  8167#  8174#  8176#  8183#  8185#  8192#  8194#
                8198#  8204#  8207#  8242#  8306#  8369#  8373#  8375#  8382#  8384#  8389#  8394#  8399#  8413#  8419#
                8424#  8432#  8434#  8439#  8444#  8451#  8453#  8461#  8471#  8473#  8478#  8483#  8491#  8497#  8502#
                8510#  8512#  8517#  8522#  8527#  8535#  8537#  8542#  8547#  8554#  8558#  8562#  8564#  8572#  8574#
                8582#  8584#  8591#  8593#  8598#  8603#  8608#  8622#  8628#  8633#  8642#  8647#  8652#  8662#  8664#
                8669#  8674#  8679#  8688#  8694#  8699#  8708#  8713#  8723#  8725#  8733#  8743#  8745#  8750#  8755#
                8760#  8766#  8772#  8777#  8785#  8787#  8792#  8797#  8802#  8807#  8815#  8817#  8824#  8826#  8833#
                8835#  8842#  8844#  8851#  8853#  8857#  8872#  8874#  8879#  8884#  8889#  8896#  8900#  8903#
MSWORD             1#  1242#  1310#  1319   1366#  1368   1369   1370   1371   1372   1373   1374   1375   1376   1377
                1378   1379   1380   1381   1382   1383   1384   1385   1386   1387   1388   1389   1390   1391   1392
                1393   1394   1395   2587#  2588   2589   2590   2621#  2622   2623   2624   3802#  3803   3804   3805
                3907#  3908   3909   3910   4012#  4013   4014   4015   4085#  4086   4087   4088   4153#  4154   4155
                4156   4217#  4218   4219   4220   4230#  4231   4232   4233   4310#  4311   4312   4313   4332#  4333
                4334   4335   4382#  4383   4384   4385   4435#  4436   4437   4438   4494#  4495   4496   4497   4511#
                4512   4513   4514   4527#  4528   4529   4530   4956#  4957   4958   4959   5001#  5002   5003   5004
                5219#  5220   5221   5222   5256#  5257   5258   5259   5277#  5278   5279   5280   5309#  5310   5311
                5312   5330#  5331   5332   5333   5642#  5643   5644   5645   5663#  5664   5665   5666   5686#  5687
                5688   5689   5712#  5713   5714   5715   5729#  5730   5731   5732   5752#  5753   5754   5755   5808#
                5809   5810   5811   5824#  5825   5826   5827   5880#  5881   5882   5883   5896#  5897   5898   5899
                6222#  6223   6224   6225   6258#  6259   6260   6261   6326#  6327   6328   6329   6391#  6392   6393
                6394   6458#  6459   6460   6461   6523#  6524   6525   6526   6588#  6589   6590   6591   6655#  6656
                6657   6658   6791#  6792   6793   6794   6849#  6850   6851   6852   6902#  6903   6904   6905   6949#
                6950   6951   6952   6995#  6996   6997   6998   7055#  7056   7057   7058   7088#  7089   7090   7091
                7127#  7128   7129   7130   7155#  7156   7157   7158   7178#  7179   7180   7181   7197#  7198   7199
                7200   7211#  7212   7213   7214   7253#  7254   7255   7256   7295#  7296   7297   7298   7341#  7342
                7343   7344   7405#  7406   7407   7408   7493#  7494   7495   7496   7537#  7538   7539   7540   7635#
                7636   7637   7638   7661#  7662   7663   7664   7705#  7706   7707   7708   7773#  7774   7775   7776
                7824#  7825   7826   7827   7874#  7875   7876   7877   7903#  7904   7905   7906   7927#  7928   7929
                7930   7946#  7947   7948   7949   7960#  7961   7962   7963   7984#  7985   7986   7987   8036#  8037
                8038   8039   8054#  8055   8056   8057   8085#  8086   8087   8088   8131#  8132   8133   8134   8198#
                8199   8200   8201   8394#  8395   8396   8397   8419#  8420   8421   8422   8444#  8445   8446   8447
                8483#  8484   8485   8486   8497#  8498   8499   8500   8522#  8523   8524   8525   8547#  8548   8549
                8550   8603#  8604   8605   8606   8628#  8629   8630   8631   8647#  8648   8649   8650   8674#  8675
                8676   8677   8694#  8695   8696   8697   8713#  8714   8715   8716   8755#  8756   8757   8758   8772#
                8773   8774   8775   8797#  8798   8799   8800   8857#  8858   8859   8860   8884#  8885   8886   8887
                8924#  8929#  8934#  8978   8979
MSXFER             1#  1242#
NEWTST          1670#  3745   3854   3914   4019   4102   4161   4238   4392   4540   4785   5109   5341   5395   5450
                5516   5918   5973   6028   6082   6144   6266   6334   6399   6466   6531   6596   6664   8316
NTST            1670#  3745   3854   3914   4019   4102   4161   4238   4392   4540   4785   5109   5341   5395   5450
                5516   5918   5973   6028   6082   6144   6266   6334   6399   6466   6531   6596   6664   8316
OPEN               1#  1242#
POINTE             1#  1242#  1259
PRINTB             1#  1242#  2658   2667   2739   2748   2975   2984   3482   3821
PRINTF             1#  1242#
PRINTS             1#  1242#
PRINTX             1#  1242#  2703   2719   2769   2776   2795   2806   2825   2836   2855   2867   2874   2893   2904
                2923   2934   2953   3014   3023   3031   3039   3047   3071   3086   3109   3117   3125   3134   3142
                3150   3183   3207   3220   3248   3257   3265   3280   3292   3307   3349   3357   3371   3378   3392
                3399   3413   3420   3441   3449   3459   3466   3828   3834   3840   6795
READBU             1#  1242#
READEF             1#  1242#  3520   3526   3532   3538
RFLAGS             1#  1242#
```

```
SETDF   1670#  2192  2232  2272  2315  2378  2563  4661  4703  8281
SETHRD  1670#
SETPRI     1#  1242#
SETSF   1670#
SETSFT  1670#
SETVEC     1#  1242#  3552  3615  3623  3663  3771
SLASH      1#  1242#
STARS      1#  1242#
SVC        1#  1240#  1241
T$GEN   1670#  2192  2232  2272  2315  2378  2563  4661  4703  8281
XFER       1#  1242#
XFERF      1#  1242#
XFERT      1#  1242#
$GEDF   1670#  2586  2620  3801  3906  4011  4084  4152  4216  4229  4309  4331  4381  4434  4493
        4510   4526  4955  5000  5218  5255  5276  5308  5329  5641  5662  5685  5711  5728  5751
        5807   5823  5879  5895  6221  6257  6325  6390  6457  6522  6587  6654  6790  6848  6901
        6948   6994  7054  7087  7126  7154  7177  7196  7210  7252  7294  7340  7404  7492  7536
        7634   7660  7704  7772  7823  7873  7902  7926  7945  7959  7983  8035  8053  8084  8130
        8197   8393  8418  8443  8482  8496  8521  8546  8602  8627  8646  8673  8693  8712  8754
        8771   8796  8856  8883
$GEHRD  1670#
$GESF   1670#
$GESFT  1670#
$GTDF   1670#  2191  2231  2271  2314  2377  2562  4660  4702  8280
$GTHRD  1670#
$GTSF   1670#
$GTSFT  1670#
```

```
. ABS.  040344      000

 ERRORS DETECTED:  0

 CVDMAA.BIN,CVDMAA.SEQ/CRF/SOL=SVC34R.MAC,CVDMAA.P11
 RUN-TIME: 49 58 6 SECONDS
 RUN-TIME RATIO: 165/113=1.4
 CORE USED:  24K  (47 PAGES)
```