DMV11 DMV-11 LN UNT STC 3
CVOMECO

AH-S394C-MC
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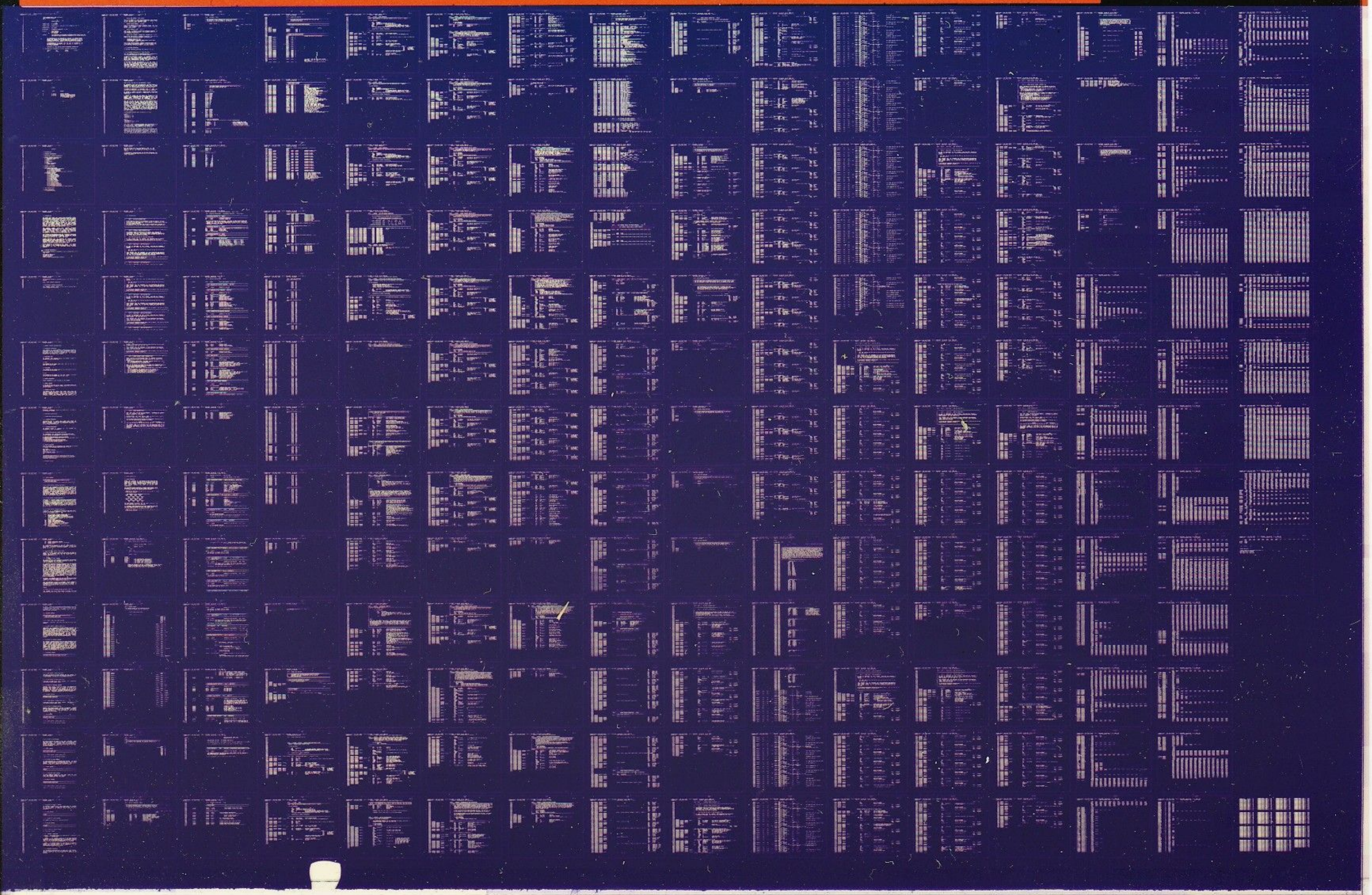

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                        .TITLE CVDMECO DMV11 LINE UNIT DIAG3
                        .SBTTL PROGRAM DOCUMENT
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                                        IDENTIFICATION
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                        PRODUCT CODE:   AC-S392C-MC

                        PRODUCT NAME:   CVDMECO DMV-11 LINE UNIT STATIC DIAGNOSTIC PART #3

                        PRODUCT DATE:   JULY 1983

                        MAINTAINER:     DIAGNOSTICS MERRIMACK  CC:38P

                        AUTHORS:        CHRIS BRIEMEN
                                        DAVE HOFFMAN
                                        RAY MARSHALL

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


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41
42
43
44
45
46                                        HISTORY
47                                        -------
48
49
50                              REV         DATE          REASON
51                              ---         ----          ------
52
53                               A        14-JAN-81     INITIAL RELEASE
54                               B        11-JUL-83     INSTALL OUTSTANDING PATCHES
55                               C        29-JUL-84     INCREASED TIMING PARAMETERS
56                                                      TO ALLOW PROGRAM TO RUN ON
57                                                      A J-11 PROCESSOR (ORION).
58
59
```

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 STATIC DIAGNOSTIC TESTING OF THE VIA, FIFO, USYRT (BCP/BOP MODES), AND LINE DRIVERS ON THESE BOARDS. NOTE THAT ALL EXTERNAL LOOPBACK (XLB) TESTS ARE CONTAINED HERE. THE FOLLOWING FUNCTIONS WILL BE PERFORMED: MODEM LOOPBACK AND ASSORTED EXTERNAL LOOPBACK TESTS (INCLUDING BCP:CRC-16/ODD VRC/EVEN VRC; BOP:CRC-CCITT-1'S/0'S).

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

```
                        THE FOLLOWING HARDWARE IS REQUIRED TO FULLY TEST THE DMV-11 LINE
                        DRIVERS:

                        M3254, M3255 LOOPBACK CONNECTORS


                        3.0 PRELIMINARY PROGRAM REQUIREMENTS

                        THIS  PROGRAM  (CVDME)  SHOULD  BE THE LAST OF THE FIVE DMV-11
                        STATIC DIAGNOSTICS TO BE RUN.
```

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 IS ABOUT 30 SECONDS PER PASS FOR EACH UNIT.

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
CVDME-C-0
DMV-11 LINE UNIT TESTS - PART 3 OF 3
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

```
278
279                                  6.3.1 START COMMAND
280
281
282                                  ************************************************************
283                                  STA(RT)/TESTS:<TEST-LIST>/PASS:<PASS-CNT>/FLAGS:
284                                     <FLAG-LIST>/EOP:<INCR>
285                                  ************************************************************
286
287
288                                  6.3.1.1 TESTS SWITCH (/TESTS:<TEST-LIST>)
289
290                                  <TEST-LIST>  IS  A SEQUENCE OF DECIMAL NUMBERS (1:2 ETC.) OR
291                                  RANGES OF DECIMAL NUMBERS (1-5:8-10 ETC.) THAT  SPECIFY  THE
292                                  TESTS  TO BE EXECUTED.  THE NUMBERS ARE SEPARATED BY COLONS.
293                                  THE NUMBERS RANGE FROM 1 TO THE LARGEST TEST NUMBER  IN  THE
294                                  DIAGNOSTIC.  THEY MAY BE SPECIFIED IN ANY ORDER.  TESTS WILL
295                                  BE EXECUTED IN NUMERICAL ORDER REGARDLESS OF  THE  ORDER  OF
296                                  SPECIFICATION.  THE  DEFAULT  IS  TO EXECUTE ALL TESTS.  ON
297                                  THIS AND ALL SWITCHES, THE ANGLE BRACKETS <> ARE PUNCTUATION
298                                  USED  IN THE DEFINITION ONLY, AND ARE NOT TO BE TYPED BY THE
299                                  OPERATOR.  SEE EXAMPLE AT END OF 6.3.1.5.
300
301
302                                  6.3.1.2 PASS SWITCH (/PASS:<PASS-CNT>)
303
304                                  <PASS-CNT> IS A DECIMAL NUMBER INDICATING THE DESIRED NUMBER
305                                  OF  PASSES.  A PASS IS DEFINED AS THE EXECUTION OF THE FULL
306                                  DIAGNOSTIC (ALL SELECTED TESTS) AGAINST ALL UNITS SUBMITTED.
307                                  THE DEFAULT IS NON-ENDING EXECUTION.  IN THIS CASE EXIT FROM
308                                  THE PROGRAM IS ACCOMPLISHED EITHER BY TYPING A CONTROL/C  OR
309                                  BY  OCCURANCE  OF AN ERROR WITH THE HALT ON ERROR FLAG BEING
310                                  SET.  THE EXIT IS A RETURN TO COMMAND MODE.  SEE EXAMPLE  AT
311                                  END OF 6.3.1.5.
312
313
314                                  6.3.1.3 FLAGS SWITCH (/FLAGS:<FLAG-LIST>)
315
316                                  <FLAG-LIST>  IS  A  SEQUENCE OF ELEMENTS OF THE FORM <FLAG>,
317                                  <FLAG=1>, OR <FLAG=0>, SEPARATED BY COLONS, WHERE <FLAG> HAS
318                                  ONE OF THE FOLLOWING VALUES:
319
320                                     HOE   HALT ON ERROR, CAUSING COMMAND MODE TO BE
321                                           ENTERED WHEN AN ERROR IS ENCOUNTERED
322                                     LOE   LOOP ON ERROR, CAUSING THE DIAGNOSTIC TO LOOP
323                                           CONTINUOUSLY WITHIN THE SMALLEST DEFINED BLOCK
324                                           OF CODING (SEGMENT, SUBTEST, OR TEST) CONTAIN-
325                                           ING THE ERROR
326                                     IER   INHIBIT ERROR REPORTING
327                                     IBE   INHIBIT BASIC ERROR REPORTS
328                                     IXE   INHIBIT EXTENDED ERROR REPORTS
329                                     PRI   DIRECT ALL MESSAGES TO A LINE PRINTER
330                                     PNT   PRINT NUMBER OF TEST BEING EXECUTED
331                                     BOE   BELL ON ERROR
332                                     UAM   RUN IN UNATTENDED MODE, BYPASSING MANUAL
333                                           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>
**********************************************************************
```

```
446
447                                 6.3.3.1 PASS SWITCH (/PASS:<PASS-CNT>)
448
449                                 <PASS-CNT> IS SAME AS IN START COMMAND, BUT THE  DEFAULT  IS
450                                 THE UNSATISFIED PASS-CNT FROM THE PREVIOUS START OR RESTART.
451                                 IF NONE REMAINS, THE DEFAULT IS NON-ENDING EXECUTION.
452
453
454                                 6.3.3.2 FLAG SWITCH (/FLAGS:<FLAG-LIST>)
455
456                                 <FLAG-LIST> IS SAME AS IN  START  COMMAND,  BUT  UNSPECIFIED
457                                 FLAGS RETAIN THEIR CURRENT VALUE.
458
459
460                                 6.3.3.3 EFFECT OF CONTINUE COMMAND
461
462                                 CONTINUE  MUST  FOLLOW  A START OR RESTART, AND COMMAND MODE
463                                 MUST HAVE  BEEN  ENTERED  DUE  TO  A  HALT  ON  ERROR  OR  A
464                                 CONTROL/C.  THE  EFFECT  OF  THE  COMMAND  IS  TO  GO TO THE
465                                 BEGINNING OF THE TEST THAT WAS BEING EXECUTED WHEN THE  HALT
466                                 OR  CONTROL/C  TOOK PLACE.  SOFTWARE DIALOGUE MAY OPTIONALLY
467                                 BE REEXECUTED.  HARDWARE PARAMETERS MAY NOT BE CHANGED.
468
469
470                                 6.3.4 PROCEED COMMAND
471
472                                 ************************************************************
473                                 PRO(CEED)/FLAGS:<FLAG-LIST>
474                                 ************************************************************
475
476
477                                 6.3.4.1 FLAGS SWITCH (/FLAGS:<FLAG-LIST>)
478
479                                 <FLAG-LIST> IS AS IN  THE  START  COMMAND,  BUT  UNSPECIFIED
480                                 FLAGS RETAIN THEIR CURRENT VALUE.
481
482
483                                 6.3.4.2 EFFECT OF PROCEED COMMAND
484
485                                 PROCEED  MUST FOLLOW A START, RESTART, OR CONTINUE.  COMMAND
486                                 MODE MUST HAVE BEEN ENTERED VIA A HALT ON ERROR.  THE EFFECT
487                                 OF  THE  COMMAND  IS  TO  BEGIN  EXECUTION  AT  THE LOCATION
488                                 FOLLOWING THE ERROR CALL.  NEITHER  HARDWARE  NOR  SOFTWARE
489                                 PARAMETERS MAY BE ALTERED.
490
491
492                                 6.3.5 ADD COMMAND
493
494                                 ************************************************************
495                                 ADD/UNITS:<UNIT-LIST>
496                                 ************************************************************
497
498
499                                 6.3.5.1 UNITS SWITCH (/UNITS:<UNIT-LIST>
500
501                                 <UNIT-LIST> IS AS IN THE RESTART COMMAND.
```

```
502
503
504                          6.3.5.2 EFFECT OF ADD COMMAND
505
506                          THE UNITS SPECIFIED ARE ADDED TO THE TEST SEQUENCE.  EACH
507                          UNIT MUST HAVE A P-TABLE IN MEMORY DUE TO AN EARLIER
508                          HARDWARE DIALOGUE.  THIS COMMAND MUST BE FOLLOWED BY A
509                          RESTART OR CONTINUE.  THE UNITS SWITCH MUST BE SPECIFIED.
510                          THE ADD COMMAND IS MEANINGFUL ONLY FOR UNITS THAT WERE
511                          PREVIOUSLY DROPPED.
512
513
514                          6.3.6 DROP COMMAND
515
516                          ************************************************************
517                          DRO(P)/UNITS:<UNIT-LIST>
518                          ************************************************************
519
520
521                          6.3.6.1 UNITS SWITCH (/UNITS:<UNIT-LIST>)
522
523                          <UNIT-LIST> IS AS IN THE RESTART COMMAND.
524
525
526                          6.3.6.2 EFFECT OF DROP COMMAND
527
528                          THE UNITS SPECIFIED WILL BE DROPPED FROM TESTING.  THE UNITS
529                          WILL BE RESELECTED ONLY BY THE EXECUTION OF AN ADD OR START
530                          COMMAND.  THE UNITS SWITCH MUST BE ENTERED.  THIS COMMAND
531                          MUST BE FOLLOWED BY A RESTART OR A CONTINUE COMMAND.
532
533
534                          6.3.7 PRINT COMMAND
535
536                          ************************************************************
537                          PRI(NT)
538                          ************************************************************
539
540
541                          6.3.7.1 EFFECT OF PRINT COMMAND
542
543                          THE TOTAL NUMBER OF ERRORS FOR EACH UNIT SINCE THE LAST
544                          START OR RESTART COMMAND ARE PRINTED.  THE ISR (INHIBIT
545                          STATISTICAL REPORTING) FLAG IS CLEARED.
546
547
548                          6.3.8 DISPLAY COMMAND
549
550                          ************************************************************
551                          DIS(PLAY)/UNITS:<UNIT-LIST>
552                          ************************************************************
553
554
555                          6.3.8.1 UNITS SWITCH (/UNITS:<UNIT-LIST>)
556
557                          <UNIT-LIST> IS AS IN THE RESTART COMMAND.
```

6.3.8.2 EFFECT OF DISPLAY COMMAND

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

6.3.9 FLAGS COMMAND

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

6.3.9.1 EFFECT OF FLAGS COMMAND

THE CURRENT SETTINGS OF ALL FLAGS ARE PRINTED.

6.3.10 ZFLAGS COMMAND

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

6.3.10.1 EFFECT OF ZFLAGS COMMAND

ALL FLAGS ARE CLEARED.

6.3.11 CONTROL CHARACTERS

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

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

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

6.3.12 HARDWARE PARAMETERS

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

1. DEVICE CSR ADDRESS : (O) 160020?

THIS IS THE ADDRESS AT WHICH THE CSR REGISTERS (SELO) 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.

4. BOARD TYPE (0-M8064, 1-M8053-V35, 2-M8053-EIA) : (O) 0 ?

THIS IS THE TYPE OF DMV-11 CURRENTLY INSTALLED. NOTE THAT THE M8053 IS SWITCH SELECTABLE BETWEEN V.35 AND EIA.

5. TURNAROUND CONNECTOR TYPE .
(0-M9254/9255, 1-INTEGRAL MODEM CABLE, 2-EIA CABLE, 3-V.35 CABLE, 4-NONE) : (O) 0 ?

THIS IS THE TYPE OF EXTERNAL LOOPBACK CONNECTOR BEING USED. IF NO LOOPBACK CONNECTOR IS PRESENT (4), THE EXTERNAL LOOPBACK TESTS WILL ALL BE RUN USING TTL-INTERNAL LOOPBACK.

6.3.13 SOFTWARE PARAMETERS

NO SOFTWARE PARAMETER QUESTIONS ARE ASKED BY THIS TEST.

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).
```

```
                        7.0 TEST DESCRIPTIONS


                        ;*****************************************************************************
                        ;*      TEST 1  <RX DATA FLUSHING TEST>
                        ;*
                        ;*  IN BCP MODE/HALF DUPLEX IT IS DESIRABLE TO HAVE THE ABILITY TO FLUSH
                        ;*  THE USYRT OF ITS CRC CHARACTERS. THIS FLUSHING IS ACCOMPLISHED BY WRITING
                        ;*  TO THE VIA SHIFT REGISTER.
                        ;*  THIS TEST VERIFIES THAT WHEN THE VIA SR IS WRITTEN INTO, 8 PULSES WILL
                        ;*  BE GENERATED AT THE CB1 PIN (WHICH DIRECTLY FEEDS THE CHARACTER FIFO).
                        ;*
                        ;*****************************************************************************


                        ;*****************************************************************************
                        ;*      TEST 2  <INTEGRAL MODEM INTERFACE TEST>
                        ;*
                        ;*  THE INTEGRAL MODEM IS SELECTED BY THE PROGRAM AND A MESSAGE IS
                        ;*  TRANSMITTED,  RECEIVED,  AND CHECKED USING A TURNAROUND CONNECTOR ON
                        ;*  THE  BOARD  OR  AT THE END OF A CABLE. THE FOLLOWING MESSAGE WILL BE
                        ;*  SENT IN BCP MODE WITH CRC-16 SPECIFIED:
                        ;*
                        ;*      SYNC SYNC 000 125 252 377 000 CRC1 CRC2 SYNC
                        ;*
                        ;*  IF  THE  P-TABLE  FOR  THE  CURRENT  UNIT INDICATES THAT NO EXTERNAL
                        ;*  TURNAROUND IS PROVIDED, THE TEST WILL BE SKIPPED FOR THAT UNIT.
                        ;*****************************************************************************


                        ;*****************************************************************************
                        ;*      TEST 3  <DATA TEST -- BCP XLB CRC-16>
                        ;*
                        ;*  IF  XLB  IS  SPECIFIED  IN  THE  P-TABLE,  THIS TEST WILL TRANSMIT &
                        ;*  RECEIVE  IN  BCP  MODE  WITH  CRC-16  ERROR  DETECTION THE FOLLOWING
                        ;*  MESSAGE:
                        ;*
                        ;*     125  252  000 377 001 002 004 010 020 040 100 200 376 375 373 367
                        ;*     357 337 277 177
                        ;*
                        ;*  THIS  MESSAGE  WILL  BE  PRECEDED  BY 3 SYNC CHARACTERS AND REPEATED
                        ;*  THREE  TIMES WITH CRC'S FOLLOWING EACH ONE. THE LAST TRANSMISSION OF
                        ;*  THE  CRC  WILL BE FOLLOWED BY SEVERAL SYNC CHARACTERS BEFORE DROPPING
                        ;*  TXE & RXE. 8-BIT CHARACTER LENGTHS ARE ALSO UTILIZED.
                        ;*
                        ;*  IF XLB WAS NOT SPECIFIED (AND/OR BOARD TYPE IS M8064), THIS TEST MAY BE RUN
                        ;*  USING INTERNAL LOOPBACK (TTLOOP=1).
                        ;*****************************************************************************


                        ;*****************************************************************************
                        ;*      TEST 4  <DATA TEST -- BCP XLB ODD VRC>
                        ;*
                        ;*  IF  XLB  IS  SPECIFIED  IN  THE  P-TABLE,  THIS TEST WILL TRANSMIT &
```

```
                        ;*  RECEIVE  IN  BCP  MODE  WITH  ODD  VRC ERROR DETECTION THE FOLLOWING
                        ;*  MESSAGE:
                        ;*
                        ;*     125  252  000 377 001 002 004 010 020 040 100 200 376 375 373 367
                        ;*     357 337 277 177
                        ;*
                        ;*  THIS  MESSAGE  WILL  BE  PRECEDED  BY 3 SYNC CHARACTERS AND REPEATED
                        ;*  THREE  TIMES.  AFTER  THE  LAST MESSAGE, SEVERAL SYNC CHARACTERS ARE
                        ;*  SENT  BEFORE  DROPING  TXE  &  RXE. 7-BIT CHARACTER LENGTHS ARE ALSO
                        ;*  UTILIZED.
                        ;*
                        ;*  IF XLB WAS NOT SPECIFIED (AND/OR BOARD TYPE IS M8064), THIS TEST MAY BE RUN
                        ;*  USING INTERNAL LOOPBACK (TTLOOP=1).
                        ;**********************************************************************************


                        ;**********************************************************************************
                        ;*      TEST 5  <DATA TEST -- BCP XLB EVEN VRC>
                        ;*
                        ;*  IF  XLB  IS  SPECIFIED  IN  THE  P-TABLE,  THIS TEST WILL TRANSMIT &
                        ;*  RECEIVE  IN  BCP  MODE  WITH  EVEN VRC ERROR DETECTION THE FOLLOWING
                        ;*  MESSAGE:
                        ;*
                        ;*     125  252  000 377 001 002 004 010 020 040 100 200 376 375 373 367
                        ;*     357 337 277 177
                        ;*
                        ;*  THIS  MESSAGE  WILL  BE  PRECEDED  BY 3 SYNC CHARACTERS AND REPEATED
                        ;*  THREE  TIMES.  AFTER  THE  LAST MESSAGE, SEVERAL SYNC CHARACTERS ARE
                        ;*  SENT  BEFORE  DROPING  TXE  &  RXE. 7-BIT CHARACTER LENGTHS ARE ALSO
                        ;*  UTILIZED.
                        ;*
                        ;*  IF XLB WAS NOT SPECIFIED (AND/OR BOARD TYPE IS M8064), THIS TEST MAY BE RUN
                        ;*  USING INTERNAL LOOPBACK (TTLOOP=1).
                        ;**********************************************************************************


                        ;**********************************************************************************
                        ;*      TEST 6  <DATA TEST -- BOP XLB CRC-CCITT-1>
                        ;*
                        ;*  IF  XLB  IS  SPECIFIED  IN  THE  P-TABLE,  THIS TEST WILL TRANSMIT &
                        ;*  RECEIVE  IN  BOP MODE WITH CRC-CCITT-1 ERROR DETECTION THE FOLLOWING
                        ;*  SHORT MESSAGE:  125  252  000 377 001
                        ;*
                        ;*  THIS  MESSAGE  WILL  BE  PRECEDED  BY FLAG CHARACTERS AND REPEATED
                        ;*  THREE  TIMES WITH CRC AND FLAG'S FOLLOWING EACH ONE. 8-BIT CHARACTER
                        ;*  LENGTHS ARE ALSO UTILIZED.
                        ;*
                        ;*  IF XLB WAS NOT SPECIFIED (AND/OR BOARD TYPE IS M8064), THIS TEST MAY BE RUN
                        ;*  USING INTERNAL LOOPBACK (TTLOOP=1).
                        ;**********************************************************************************


                        ;**********************************************************************************
                        ;*      TEST 7  <DATA TEST -- BOP XLB CRC-CCITT-0>
                        ;*
                        ;*  IF  XLB  IS  SPECIFIED  IN  THE  P-TABLE,  THIS TEST WILL TRANSMIT &
```

```
                        ;*  RECEIVE  IN  BOP MODE WITH CRC-CCITT-0 ERROR DETECTION THE FOLLOWING
                        ;*  SHORT MESSAGE:  125  252  000  377  001
                        ;*
                        ;*  THIS  MESSAGE  WILL  BE  PRECEDED  BY FLAG CHARACTERS AND REPEATED
                        ;*  THREE  TIMES WITH CRC AND FLAG'S FOLLOWING EACH ONE. 8-BIT CHARACTER
                        ;*  LENGTHS ARE ALSO UTILIZED.
                        ;*
                        ;*  IF XLB WAS NOT SPECIFIED (AND/OR BOARD TYPE IS M8064), THIS TEST MAY BE RUN
                        ;*  USING INTERNAL LOOPBACK (TTLOOP=1).
                        ;*********************************************************************************


                        ;*********************************************************************************
                        ;*      TEST 8  <MODEM CONTROL SIGNAL LOOPBACK TEST>
                        ;*
                        ;*  FIRST, THE DMV-11 IS INITIALIZED. THEN, TTL LOOPBACK IS SELECTED,
                        ;*  AND THE FOLLOWING CHECKS ARE PERFORMED INVOLVING THE MODEM STATUS
                        ;*  REGISTER :
                        ;*  - RING, CARRIER, MODEM READY, TEST MODE, CTS ARE CHECKED FOR 1 STATE.
                        ;*  - RTS IS DE-ASSERTED AND CTS IS CHECKED FOR 0.
                        ;*  - RTS IS ASSERTED AND CTS IS CHECKED FOR 1.
                        ;*
                        ;*  NEXT, IF THE OPTION IS AN M8053 WITH AN M3254 TEST CONNECTOR INSTALLED,
                        ;*  THE DMV-11 IN INITIALIZED AGAIN, (TTL LOOPBACK IS CLEARED), AND
                        ;*  THE FOLLOWING CHECKS ARE PERFORMED :
                        ;*  - RING, CARRIER, MODEM READY, CTS ARE CHECKED FOR 1, TEST MODE IS CHECKED
                        ;*      FOR 0.
                        ;*  - RTS IS DE-ASSERTED, AND CARRIER AND CTS ARE CHECKED FOR 0.
                        ;*  - RTS IS ASSERTED, AND CARRIER AND CTS ARE CHECKED FOR 1.
                        ;*  - DTR IS DE-ASSERTED, AND MODEM READY IS CHECKED FOR 0.
                        ;*  - DTR IS ASSERTED, AND MODEM READY IS CHECKED FOR 1.
                        ;*********************************************************************************
```

```
882                             ;*****************************************************************************
883                             ;*      TEST 9  <DDCMP MESSAGE TEST>
884                             ;*
885                             ;*  THIS  TEST  WILL  USE XLB IF IT IS ENABLED -- OTHERWISE TTL LOOPBACK
886                             ;*  WILL  BE  UTILIZED.  THIS  ASSURES  THAT  IT  CAN ALWAYS BE RUN AS A
887                             ;*  GENERAL "RINGOUT" OF THE M8053.
888                             ;*
889                             ;*  INITIALIZATION:  BCP  MODE, CRC-16, IDLE = 0, SYNC (S/AR) = 226 OCT.
890                             ;*  (96 HEX.), RXCL & TXCL = 0 (CHAR. LENGTH = 8).
891                             ;*
892                             ;*  THE FOLLOWING SAMPLE DDCMP MESSAGE IS TRANSMITTED & RECEIVED AND ALL
893                             ;*  DATA AND CRC CHARACTERS ARE CHECKED FOR ERRORS:
894                             ;*
895                             ;*          ---------- HEADER ----------   --- DATA (PATTERN K) -----
896                             ;*  SYNC SYNC 201 000 075 003 002 001 CRC CRC 000 377 ... 252 000 CRC CRC
897                             ;*
898                             ;*  THE  ATTEMPT  HERE  IS TO PROVIDE A TEST JUST BELOW THE LEVEL OF THE
899                             ;*  FUNCTIONAL  DIAGNOSTIC.  THE  USYRT  WILL BE RESPONSIBLE FOR ALL CRC
900                             ;*  GENERATION  AND  VERIFICATION BUT THE CRC'S WILL ALSO BE VERIFIED BY
901                             ;*  SOFTWARE.
902                             ;*****************************************************************************
903
904
```

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 :

```
CVDME 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 :

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

```
                        .SBTTL GENERAL EQUATES AND DS INVOCATION & SETUP

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.
```

```
                        .SBTTL  PROGRAM HEADER
                        ;++
                        ; THE PROGRAM HEADER IS THE INTERFACE BETWEEN
                        ; THE DIAGNOSTIC PROGRAM AND THE SUPERVISOR.
                        ;--

002000                          POINTER BGNAU,BGNDU,ERRTBL

                                HEADER  CVDME,C,0,15.,0
002000
002000  103                                             L$NAME::
002001  126                                                     .ASCII /C/
002002  104                                                     .ASCII /V/
002003  115                                                     .ASCII /D/
002004  105                                                     .ASCII /M/
002005  000                                                     .ASCII /E/
002006  000                                                     .BYTE   0
002007  000                                                     .BYTE   0
002010                                                          .BYTE   0
002010  103                                             L$REV::
002011                                                          .ASCII  /C/
002011  060                                             L$DEPO::
002012                                                          .ASCII  /0/
002012  000000                                          L$UNIT::
002014                                                          .WORD   0
002014  000017                                          L$TIML::
002016                                                          .WORD   15.
002016  033652                                          L$HPCP::
002020                                                          .WORD   L$HARD
002020  000000                                          L$SPCP::
002022                                                          .WORD   0
002022  002150                                          L$HPTP::
002024                                                          .WORD   L$HW
002024  000000                                          L$SPTP::
002026                                                          .WORD   0
002026  034514                                          L$LADP::
002030                                                          .WORD   L$LAST
002030  000000                                          L$STA::
002032                                                          .WORD   0
002032  000000                                          L$CO::
002034                                                          .WORD   0
002034  000000                                          L$DTYP::
002036                                                          .WORD   0
002036  000000                                          L$APT::
002040                                                          .WORD   0
002040  002124                                          L$DTP::
002042                                                          .WORD   L$DISPATCH
002042  000000                                          L$PRIO::
002044                                                          .WORD   0
002044  000000                                          L$ENVI::
002046                                                          .WORD   0
002046  000000                                          L$EXP1::
002050                                                          .WORD   0
002050  003                                             L$MREV::
002051  003                                                     .BYTE   C$REVISION
                                                                .BYTE   C$EDIT
```

```
1032  002052
1033  002052  000000          L$EF::
                                      .WORD   0
1034  002054  000000                  .WORD   0
1035  002056                  L$SPC::
1036  002056  000000                  .WORD   0
1037  002060                  L$DEVP::
1038  002060  003264                  .WORD   L$DVTYP
1039  002062                  L$REPP::
1040  002062  000000                  .WORD   0
1041  002064                  L$EXP4::
1042  002064  000000                  .WORD   0
1043  002066                  L$EXP5::
1044  002066  000000                  .WORD   0
1045  002070                  L$AUT::
1046  002070  023230                  .WORD   L$AU
1047  002072                  L$DUT::
1048  002072  023224                  .WORD   L$DU
1049  002074                  L$LUN::
1050  002074  000000                  .WORD   0
1051  002076                  L$DESP::
1052  002076  003304                  .WORD   L$DESC
1053  002100                  L$LOAD::
1054  002100  104035                  EMT     E$LOAD
1055  002102                  L$ETP::
1056  002102  002172                  .WORD   L$ERRTBL
1057  002104                  L$ICP::
1058  002104  022554                  .WORD   L$INIT
1059  002106                  L$CCP::
1060  002106  023222                  .WORD   L$CLEAN
1061  002110                  L$ACP::
1062  002110  023076                  .WORD   L$AUTO
1063  002112                  L$PRT::
1064  002112  022546                  .WORD   L$PROT
1065  002114                  L$TEST::
1066  002114  000000                  .WORD   0
1067  002116                  L$DLY::
1068  002116  000000                  .WORD   0
1069  002120                  L$HIME::
1070  002120  000000                  .WORD   0
1071
1072
1073                    .EVEN
```

M2


```
                        .SBTTL  DISPATCH TABLE

                        SLASH
                        ;;//////////////////////////////////////////////////////////////////
                        ;/ THE DISPATCH TABLE CONTAINS THE STARTING ADDRESS OF EACH TEST.
                        ;/ IT IS USED BY THE SUPERVISOR TO DISPATCH TO EACH TEST.
                        SLASH
                        ;;//////////////////////////////////////////////////////////////////

                                DISPATCH 9.
                                                                        .WORD   9
                                                                L$DISPATCH::
                                                                        .WORD   T1
                                                                        .WORD   T2
                                                                        .WORD   T3
                                                                        .WORD   T4
                                                                        .WORD   T5
                                                                        .WORD   T6
                                                                        .WORD   T7
                                                                        .WORD   T8
                                                                        .WORD   T9
```

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

002146                          BGNHW   DFPTBL
002146  000010                                                          .WORD   L10000-L$HW/2
002150                                                                  L$HW::
002150                                                                  DFPTBL::

002150  160020                  .WORD   160020          ;DMV11 CSR UNIBUS ADDRESS
002152  000300                  .WORD      300          ;DMV11 INTERRUPT VECTOR
002154  004000                  .WORD     4000          ;DMV11 INTERRUPT PRIORITY LEVEL = 4
002156  000000                  .WORD      000          ;SWITCH REG. #1 (BOOT ADDRESS)
002160  000000                  .WORD      000          ;SWITCH REG. #2 (DDCMP ADDRESS)
002162  000000                  .WORD        0          ;MODULE IS M8064
002164  000000                  .WORD        0          ;M3254&M3255 USED
002166  000001                  .WORD        1          ;BAUD RATE = 56 K
                                                        ;       0 = 19.2 K
                                                        ;       1 = 56 K

002170                          ENDHW
002170                                                                  L10000:
```

```
                        .SBTTL  SOFTWARE P-TABLE

                        ;////////////////////////////////////////////////////////////////////////
                        ;/ THE SOFTWARE P-TABLE CONTAINS THE VALUES OF THE PROGRAM
                        ;/ PARAMETERS THAT CAN BE CHANGED BY THE OPERATOR.
                        ;////////////////////////////////////////////////////////////////////////

                                BGNSW   SFPTBL
002170                                                                  .WORD   L10001-L$SW/2
002170  000000                                                L$SW::
002172                                                          SFPTBL::
002172
                                ENDSW
002172                                                          L10001:
002172
```

```
                                .SBTTL  GLOBAL EQUATES SECTION -- BASIC EQUATES

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

002172                                  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
```

```
1192    000140                  PRIO3== 140
1193    000100                  PRIO2== 100
1194    000040                  PRIO1== 40
1195    000000                  PRIO0== 0
1196                            ;
1197                            ;OPERATOR FLAG BITS
1198                            ;
1199    000004                  EVL==       4
1200    000010                  LOT==      10
1201    000020                  ADR==      20
1202    000040                  IDU==      40
1203    000100                  ISR==     100
1204    000200                  UAM==     200
1205    000400                  BOE==     400
1206    001000                  PNT==    1000
1207    002000                  PRI==    2000
1208    004000                  IXE==    4000
1209    010000                  IBE==   10000
1210    020000                  IER==   20000
1211    040000                  LOE==   40000
1212    100000                  MOE==  100000
```

```
                        .SBTTL  REGISTER DEFINITIONS -- MAINTENANCE REGISTERS -- SELN & BSELN

                        ;;*****************************************************************************
                        ;* MAINTENANCE REGISTER # 0 - BSEL0
                        ;;*****************************************************************************
000020                  IEO     = BIT4          ;"INTERRUPT ENABLE OUT"
000001                  IEI     = BIT0          ;"INTERRUPT ENABLE IN"

                        ; BIT 7 IS ALSO USED BY THE MICROCODE.  ITS LABEL IS "RQI" WHICH STANDS FOR
                        ; "REQUIST IN".  IT'S PART OF THE HANDSHAKING FOR USING THE SEL & BSEL REG'S.
                        ; HOWEVER, THE MAINT. LOOP DOES NOT MAKE USE OF THIS BIT AND IT IS THEREFORE
                        ; UNNECESSARY TO DEFINE IT HERE.

                        ;;*****************************************************************************
                        ;* MAINTENANCE REGISTER # 1 - BSEL1
                        ;;*****************************************************************************
000200                  RUN     = BIT7          ;"RUN" & ALSO CONTROLS 6502 MICROPROCESSOR'S RDY STATE
000100                  MCLR    = BIT6          ;MASTER CLEAR
000001                  MREQ    = BIT0          ;M-LOOP ACCESS
000301                  STRTMLOP= RUN!MCLR!MREQ  ;INITIATE M-LOOP

                        ;;*****************************************************************************
                        ;* MAINTENANCE REGISTER # 2 - BSEL2
                        ;;*****************************************************************************
000200                  MRDY    = BIT7          ;M-LOOP READY

                        ;*****************************************************************************
                        ;* MAINTENANCE LOOP COMMAND DEFINITIONS
                        ;*****************************************************************************
000001                  REDLOC  = 1             ;READ LOC. W/IN DMV-11 ---- (SEL4) ---> BSEL6
000002                  WRILOC  = 2             ;WRITE LOC. W/IN DMV-11 --- BSEL6 ---> (SEL4)
000003                  REDPAG  = 3             ;READ BLOCK W/IN DMV-11 --- (SEL6) ---> (SEL4)
000004                  WRIPAG  = 4             ;WRITE BLOCK W/IN DMV-11 -- (SEL4) ---> (SEL6)
000005                  EXECUT  = 5             ;SET 6502'S PC AND EXECUTE -- SEL6 ---> PC
000007                  DOTBMT  = 7             ;SET MAINTENANCE INTERRUPT DISABLE IN PROCESSOR
                                                ;STATUS --- [KB7] ---> BSEL3
```

```
                        .SBTTL  REGISTER DEFINITIONS -- USYRT


            120400      USYRT = 120400          ;USYRT BASE ADDRESS = A100 (HEX)

                        ;;*************************************************************************
                        ;* USYRT "RECEIVER DATA BUFFER" REGISTER -- READ ONLY
                        ;;*************************************************************************

            120400      RDSRL   = 120400        ;ADDRESS OF THIS REG

                        ;;*************************************************************************
                        ;* USYRT "RECEIVER STATUS" REGISTER -- READ ONLY
                        ;;*************************************************************************

            120401      RDSRH   = 120401        ;ADDRESS OF THIS REG

                        ;BIT DEFINITIONS ON BYTE BASIS :
            000200      RERR    = BIT7          ;ERROR CHECK
            000160      ABC     = BIT6!BIT5!BIT4 ;ASSEMBLED BIT COUNT
            000010      ROR     = BIT3          ;RECEIVER OVER RUN
            000004      RABGA   = BIT2          ;RECEIVED ABORT/GA CHARACTER
            000002      REOM    = BIT1          ;RECEIVED END-OF-MESSAGE
            000001      RSOM    = BIT0          ;RECEIVED START-OF-MESSAGE

                        ;BIT DEFINITIONS ON WORD BASIS :
            100000      RXERR   = BIT15         ;RECEIVED CRC/VRC ERROR
            004000      RXOR    = BIT11         ;RECEIVER OVER RUN
            002000      RXABGA  = BIT10         ;RECEIVED ABORT/GO AHEAD CHARACTER
            001000      RXEOM   = BIT9          ;RECEIVED END-OF-MESSAGE
            000400      RXSOM   = BIT8          ;RECEIVED START-OF-MESSAGE

            000001      RERCHK  = BIT0          ;FLAG TO INVOKE RERR CHK IN SUBROUTINE RXCHAR

                        ;;*************************************************************************
                        ;* USYRT "TRANSMITTER DATA BUFFER" REGISTER
                        ;;*************************************************************************

            120402      TDSRL   = 120402        ;ADDRESS OF THIS REG

                        ;;*************************************************************************
                        ;* USYRT "TX STATUS AND CONTROL" REGISTER
                        ;;*************************************************************************

            120403      TDSRH   = 120403        ;ADDRESS OF THIS REG

                        ;BIT DEFINITIONS ON BYTE BASIS :
            000200      TERR    = BIT7          ;TRANSMITTER UNDERRUN ERROR
            000010      TGA     = BIT3          ;TRANSMIT GO AHEAD
            000004      TAB     = BIT2          ;TRANSMIT ABORT
            000002      TEOM    = BIT1          ;TRANSMIT END-OF-MESSAGE
            000001      TSOM    = BIT0          ;TRANSMIT START-OF-MESSAGE

                        ;BIT DEFINITIONS ON WORD BASIS :
            100000      TXERR   = BIT15         ;TRANSMITTER UNDERRUN ERROR
            004000      TXGA    = BIT11         ;TRANSMIT GO AHEAD
```

```
1306          002000                  TXAB    = BIT10         ;TRANSMIT ABORT
1307          001000                  TXEOM   = BIT9          ;TRANSMIT END-OF-MESSAGE
1308          000400                  TXSOM   = BIT8          ;TRANSMIT START-OF-MESSAGE
1309
1310                                  ;;**************************************************************************
1311                                  ;* USYRT "SYNC/SECONDARY ADDRESS" REGISTER
1312                                  ;;**************************************************************************
1313
1314          120404                  PCSARL  = 120404        ;ADDRESS OF THIS REG
1315          000226                  SYNCH   = 226           ;STANDARD SYNCH CHARACTER
1316
1317                                  ;;**************************************************************************
1318                                  ;* USYRT "MODE CONTROL"
1319                                  ;;**************************************************************************
1320
1321          120405                  PCSARH  = 120405        ;ADDRESS OF THIS REG
1322
1323                                  ;BIT DEFINITIONS ON BYTE BASIS:
1324
1325          000200                  APA     = BIT7          ;"ALL PARTIES ADDRESS" ENABLE
1326          000100                  PROTO   = BIT6          ;SPECIFIES BOP/CCP PROTOCOL -- 0 = BOP
1327          000040                  STRIP   = BIT5          ;STRIP EXTRA SYNC'S IN CCP MODE, SEE GA CHARS IN BOP
1328          000020                  SECAD   = BIT4          ;SECONDARY ADDRESS MODE -- BOP MODE ONLY
1329          000010                  IDLE    = BIT3          ;IDLE & SYNC CHAR. TRANSMISSION CONTROL
1330          000007                  XYZ     = BIT2!BIT1!BIT0 ;CRC/PARITY SELECTION CONTROL
1331
1332                                  ;BIT DEFINITIONS ON WORD BASIS:
1333
1334          100000                  APAD    = BIT15         ;"ALL PARTIES ADDRESS" ENABLE
1335          040000                  DDCMP   = BIT14         ;CODE FOR DDCMP MODE
1336          020000                  STRIPS  = BIT13         ;STRIP EXTRA SYNC'S IN CCP MODE, SEE GA CHARS IN BOP
1337          010000                  SECADR  = BIT12         ;SECONDARY ADDRESS MODE -- BOP MODE ONLY
1338          004000                  IDLES   = BIT11         ;IDLE & SYNC CHAR. TRANSMISSION CONTROL
1339          000400                  CRCOS   = BIT8          ;CODE FOR CRC-CCITT-0 SELECTION
1340          001400                  CRC16   = BIT9!BIT8     ;CODE FOR CRC-16 SELECTION
1341          003400                  NOCHK   = BIT10!BIT9!BIT8 ;CODE FOR NO ERROR CHECKING
1342          002400                  EVRC    = BIT10!BIT8    ;CODE FOR VRC EVEN CHECK
1343          002000                  OVRC    = BIT10         ;CODE FOR VRC ODD CHECK
1344
1345                                  ;;**************************************************************************
1346                                  ;* USYRT "DATA LENGTH SELECT" REGISTER
1347                                  ;;**************************************************************************
1348
1349          120407                  PCR     = 120407        ;ADDRESS OF THIS REG
1350
1351                                  ;BIT DEFINITIONS:
1352
1353          000340                  TXDL    = BIT7!BIT6!BIT5 ;TRANSMIT DATA LENGTH SELECTION
1354          000020                  EXADD   = BIT4          ;EXTENDED ADDRESS FIELD -- NOT USED OR TESTED
1355          000010                  EXCON   = BIT3          ;EXTENDED CONTROL FIELD -- NOT USED OR TESTED
1356          000007                  RXDL    = BIT2!BIT1!BIT0 ;RECEIVER DATA LENGTH SELECTION
1357
1358                                  ;;**************************************************************************
1359                                  ;* USYRT STATUS REGISTER (ADDR. A400)
1360                                  ;;**************************************************************************
1361          122000                  USTATR = 122000         ;USYRT STATUS REGISTER ADDRESS = A400 (HEX)
```

```
1362
1363                                    ;BIT DEFINITIONS:
1364
1365            000200          RDA     = BIT7          ;RECEIVER DATA AVAILABLE
1366            000100          TBMT    = BIT6          ;TRANSMITTER BUFFER EMPTY
1367            000040          RXACT   = BIT5          ;RECEIVER ACTIVE
1368            000020          RSA     = BIT4          ;RECEIVER STATUS AVAILABLE
1369            000010          TSO     = BIT3          ;TRANSMITTER SERIAL OUTPUT
1370            000004          TXACT   = BIT2          ;TRANSMITTER ACTIVE
1371            000002          TXU     = BIT1          ;TRANSMITTER UNDERRUN
1372            000001          SFR     = BIT0          ;SYNC/FLAG RECEIVED
```

```
                        .SBTTL  REGISTER DEFINITIONS -- 6522 VIA CHIP

120000                  VIA     = 120000                ;VIA BASE ADDRESS = A000 (HEX)

                        ;;*************************************************************************
                        ;* MODEM & MAINTENANCE CONTROL -- "ORB" 8 BIT PORT B -- WRITE ONLY
                        ;;*************************************************************************

120000                  VIAORB  = 120000                ;ADDRESS OF THIS REGISTER -- HEX = A0X0

000200                  NULCLK  = BIT7                  ;"NULL CLK L" -- NULL CLOCK
000100                  RXEN    = BIT6                  ;"RXEN." -- USYRT RECEIVER ENABLE
000040                  TXEN    = BIT5                  ;"TXENL" -- USYRT TRANSMITTER ENABLE
000020                  DTR     = BIT4                  ;"DTR" -- DATA TERMINAL READY
000010                  RTSND   = BIT3                  ;"RTSND" -- REQUEST TO SEND
000004                  HDX     = BIT2                  ;"HDX" -- HALF DUPLEX
000002                  TTLOOP  = BIT1                  ;"SELECT TTL LEVEL LOOPBACK"
000001                  PRESET  = BIT0                  ;"PRESET H" --
000000                  DTRL    = 0                     ;DTR IS ASSERTED LOW

                        ;;*************************************************************************
                        ;* MODEM STATUS REGISTER -- "ORA" 8 BIT PORT A -- READ ONLY
                        ;;*************************************************************************

120001                  VIAMS   = 120001                ;ADDRESS OF THIS REGISTER -- HEX = A0X1

000200                  RING    = BIT7                  ;"RING H" --
000100                  CARIER  = BIT6                  ;"CARRIER H" --
000040                  MDMRDY  = BIT5                  ;"MODEM RDY H" --
000020                  SPEED   = BIT4                  ;"BAUD RATE SWITCH -- (19.2K/56K)
000010                  CTS     = BIT3                  ;"CTS H -- CLEAR TO SEND
000004                  TM      = BIT2                  ;"TEST MODE H" --
000002                  RCVDAT  = BIT1                  ;"RCV DATA H" --
000001                  UMAINT  = BIT0                  ; SELECT USYRT INT LOOPBACK **SELECT BIT**


                        ;;*************************************************************************
                        ;* DATA DIRECTION FOR PORT B -- "DDRB" -- READ/WRITE
                        ;;*************************************************************************

120002                  VIADPB  = 120002                ;ADDRESS OF THIS REGISTER -- HEX = A0X2

                        ;  ALL BITS ARE DEFINED THE SAME:
                        ;       THE BIT SETTING DEFINED THE DIRECTION OF ITS RELATED BIT IN BIT PORT B

                        ;       INITIALIZED TO 377 (HEX = FF) -- PORT B IS READ/WRITE


                        ;;*************************************************************************
                        ;* DATA DIRECTION FOR PORT A -- "DDRA" -- READ/WRITE
                        ;;*************************************************************************

120003                  VIADPA  = 120003                ;ADDRESS OF THIS REGISTER -- HEX = A0X3

                        ;  ALL BITS ARE DEFINED THE SAME:
                        ;       THE BIT SETTING DEFINED THE DIRECTION OF ITS RELATED BIT IN BIT PORT A
```

```
1429
1430                            ;       INITIALIZED TO 001 (HEX = 01) -- PORT A IS READ ONLY (EXCEPT FOR
1431                            ;                                       BIT0 WHICH ENABLES USYRT INTERNAL LOOPBACK).
1432
1433
1434
1435                            ;;*****************************************************************************
1436                            ;* TIMER 1 LOW ORDER (LATCH & COUNTER) -- "T1L-L" & "T1C-L" -- WRITE & READ
1437                            ;;*****************************************************************************
1438
1439    120004                  VIAT1A  = 120004                ;ADDRESS OF THIS REGISTER -- HEX = A0X4
1440
1441                            ;  WHEN WRITING, LOW ORDER LATCH IS LOADED.
1442                            ;  WHEN READING, LOW ORDER COUNTER IS READ.
1443
1444
1445
1446                            ;;*****************************************************************************
1447                            ;* TIMER 1 HIGH ORDER COUNTER & TRIGGER -- "T1L-H AND TRIGGER" & "T1C-H"
1448                            ;*       -- WRITE & READ
1449                            ;;*****************************************************************************
1450
1451    120005                  VIAT1B  = 120005                ;ADDRESS OF THIS REGISTER -- HEX = A0X5
1452
1453                            ;  WHEN WRITING; HIGH ORDER LATCH IS LOADED, BOTH LOW & HIGH ORDER LATCHES
1454                            ;                 ARE LOADED INTO THE COUNTER, AND THE COUNTER IS STARTED.
1455
1456                            ;  WHEN READING, THE HIGH ORDER COUNTER IS READ.
1457
1458
1459
1460                            ;;*****************************************************************************
1461                            ;* TIMER 1 LOW ORDER LATCH -- "T1L-L" -- READ/WRITE
1462                            ;;*****************************************************************************
1463
1464    120006                  VIAT1C  = 120006                ;ADDRESS OF THIS REGISTER -- HEX = A0X6
1465
1466                            ;  THE LOW ORDER LATCH IS READ OR LOADED.  THIS LATCH IS USED TO LOAD THE
1467                            ;  COUNTER WHEN T1MODE (IN VIAACR) = 3
1468
1469
1470
1471                            ;;*****************************************************************************
1472                            ;* TIMER 1 HIGH ORDER LATCH -- "T1L-H" -- READ/WRITE
1473                            ;;*****************************************************************************
1474
1475    120007                  VIAT1D  = 120007                ;ADDRESS OF THIS REGISTER -- HEX = A0X7
1476
1477                            ;  THE HIGH ORDER LATCH IS READ OR LOADED.  THIS LATCH IS USED TO LOAD THE
1478                            ;  COUNTER WHEN T1MODE (IN VIAACR) = 3
1479
1480
1481
1482                            ;;*****************************************************************************
1483                            ;* TIMER 2 LOW ORDER (LATCH & COUNTER) -- "T2L-L" & "T2C-L" -- WRITE & READ
1484                            ;;*****************************************************************************
```

```
1485
1486          120010                  VIAT2A  = 120010                ;ADDRESS OF THIS REGISTER -- HEX = A0X8
1487
1488                                  ;  WHEN WRITING, LOW ORDER LATCH IS LOADED.
1489                                  ;  WHEN READING, LOW ORDER COUNTER IS READ.
1490
1491
1492
1493                                  ;;*****************************************************************************
1494                                  ;* TIMER 2 HIGH ORDER COUNTER & TRIGGER -- "T2L-H AND TRIGGER" & "T2C-H"
1495                                  ;*       -- WRITE & READ
1496                                  ;;*****************************************************************************
1497
1498          120011                  VIAT2B  = 120011                ;ADDRESS OF THIS REGISTER -- HEX = A0X9
1499
1500                                  ;  WHEN WRITING; HIGH ORDER LATCH IS LOADED, BOTH LOW & HIGH ORDER LATCHES
1501                                  ;                 ARE LOADED INTO THE COUNTER, AND THE COUNTER IS STARTED.
1502
1503                                  ;  WHEN READING, THE HIGH ORDER COUNTER IS READ.
1504
1505                                  ;;*****************************************************************************
1506                                  ;* SHIFT REGISTER -- "SR" -- READ/WRITE
1507                                  ;;*****************************************************************************
1508
1509          120012                  VIASR   = 120012                ;ADDRESS OF THIS REGISTER -- HEX = A0XA
1510
1511                                  ;  SHIFTING IS CONTROLLED BY THE SETTING OF VIASRC (ACR2 ---> ACR4) IN VIAACR
1512
1513
1514
1515                                  ;;*****************************************************************************
1516                                  ;* AUXILIARY CONTROL REGISTER -- "ACR" -- READ/WRITE
1517                                  ;;*****************************************************************************
1518
1519          120013                  VIAACR  = 120013                ;ADDRESS OF THIS REGISTER -- HEX = A0XB
1520
1521          000300                  T1MODE  = BIT7!BIT6             ;CONTROL THE MODE OF TIMER # 1
1522
1523                                          ;BIT 7:
1524                                          ; 0     P87 DISABLED -- ONLY T1TO IN VIAIFR REFLECTS TIMEOUT
1525                                          ; 1     P87 & T1TO REFLECT TIMEOUT
1526
1527                                          ;BIT 6:
1528                                          ; 0     TIMER 1 IN ONE-SHOT MODE
1529                                          ; 1     TIMER 1 IN CONTINUOUS SQUARE WAVE MODE
1530
1531          000040                  T2MODE  = BIT5                  ;CONTROLS THE MODE OF TIMER # 1
1532
1533                                          ; 0     PULSE COUNTING MODE
1534                                          ; 1     INTERVAL TIMER MODE
1535
1536          000034                  SRMODE  = BIT4!BIT3!BIT2        ;CONTROLS THE MODE OF THE SHIFT REGISTER
1537
1538                                          ; 0     SR DISABLED
1539                                          ; 1     SHIFT IN UNDER CONTROL OF T2, SHFT PULSES GEN'D ON CB1
1540                                          ; 2     SHIFT IN AT SYS. CLOCK RATE, SHFT PULSES GEN'D ON CB1
```

```
1541                                    ; 3     SHIFT IN UNDER CONTROL OF EXTERNAL INPUT PULSES
1542                                    ; 4     SHIFT OUT -- FREE RUNNING -- RATE CONTROLLED BY T2
1543                                    ; 5     SHIFT OUT -- RATE CONTROLLED BY T2 -- PULSES ON CB1
1544                                    ; 6     SHIFT OUT -- SYS. CLOCK RATE -- PULSES ON CB1
1545                                    ; 7     SHIFT OUT -- UNDER CONTROL OF PULSES APPLIED TO CB1
1546
1547        000002          PBLENB  = BIT1                  ;PB LATCH CONTROL -- 1 ENABLES LATCH
1548        000001          PALENB  = BIT0                  ;PA LATCH CONTROL -- 1 ENABLES LATCH
1549
1550
1551
1552
1553                        ;;**************************************************************************
1554                        ;* PERIPHERAL CONTROL REGISTER -- "PCR" -- READ/WRITE
1555                        ;;**************************************************************************
1556
1557        120014          VIAPCR  = 120014                ;ADDRESS OF THIS REGISTER -- HEX = A0XC
1558
1559        000340          CB2CTL  = BIT7!BIT6!BIT5        ;CB2 MODE SELECT
1560        000020          CB1CTL  = BIT4                  ;CB1 MODE SELECT
1561        000016          CA2CTL  = BIT3!BIT2!BIT1        ;CA2 MODE SELECT
1562        000001          CA1CTL  = BIT0                  ;CA1 MODE SELECT
1563
1564
1565
1566                        ;;**************************************************************************
1567                        ;* INTERRUPT FLAG REGISTER -- "IFR" -- READ ONLY
1568                        ;;**************************************************************************
1569
1570        120015          VIAIFR  = 120015                ;ADDRESS OF THIS REGISTER -- HEX = A0XD
1571
1572        000200          FLGINQ  = BIT7                  ;SET WHEN A FLAG IN THIS REG. GOES HIGH AND
1573                                                        ;ITS CORRESPONDING BIT IN VIAIER IS SET.
1574                                                        ;(I.E. VIAIER IS THE ENABLE REGISTER FOR THE
1575                                                        ;FOR THE SETTING OF IRQ AND THE ISSUEANCE OF
1576                                                        ;AN INTERRUPT TO THE 6502 WHEN IRQ IS SET.)
1577
1578        000100          FLGT1   = BIT6                  ;TIMEOUT OF TIMER 1
1579        000040          FLGT2   = BIT5                  ;TIMEOUT OF TIMER 2
1580        000020          FLGCB1  = BIT4                  ;ACTIVE TRANSITION OF PIN 18 (CB1)
1581        000010          FLGCB2  = BIT3                  ;ACTIVE TRANSITION OF PIN 19 (CB2)
1582        000004          FLGSR   = BIT2                  ;COMPLETION OF 8 SHIFTS
1583        000002          FLGCA1  = BIT1                  ;ACTIVE TRANSITION OF PIN 40 (CA1)
1584        000001          FLGCA2  = BIT0                  ;ACTIVE TRANSITION OF PIN 39 (CA2)
1585
1586
1587
1588                        ;;**************************************************************************
1589                        ;* INTERRUPT ENABLE REGISTER -- "IER" -- READ/WRITE
1590                        ;;**************************************************************************
1591
1592        120016          VIAIER  = 120016                ;ADDRESS OF THIS REGISTER -- HEX = A0XE
1593
1594        000200          INTSC   = BIT7                  ;CONTROLS THE SETTING OR CLEARING OF BITS IN
1595                                                        ;THE REST OF IER.  IF = 0  THE OTHER BITS IN
1596                                                        ;THIS REG., IF SET, WILL CLEAR THEIR RESPECTIVE
```

```
1597                                                    ;BITS IN THE INT. ENAB. REG..  IF = 1, THE
1598                                                    ;RESPECTIVE BITS WILL BE SET.
1599
1600                            ;  WHEN WRITING THIS REG., THE COMMENT ABOVE HOLDS.
1601
1602                            ;  WHEN READING THIS REG., THE CURRENT STATE OF THE INT. ENABLE REG. IS RETURNED.
1603
1604                            ;  THE BIT ASSIGNMENTS ARE THE SAME AS FOR VIAIFR AS DEFINED ABOVE.
1605
1606
1607
1608                            ;;*****************************************************************************
1609                            ;* OUTPUT REGISTER A -- "ORA" -- READ ONLY (OR READ/WRITE UNDER CONTROL OF "DDPA")
1610                            ;;*****************************************************************************
1611
1612            120017          VIAORA  = 120017                ;ADDRESS OF THIS REGISTER -- HEX = A0XF
1613
1614                            ;  THIS ADDRESS ACCESSES THE SAME DATA AS "VIAMS" EXCEPT THAT NO "HANDSHAKING"
1615                            ;  WILL TAKE PLACE (I.E. THERE IS NO CHANGE IN IRQ OR CA2 AS A RESULT OF
1616                            ;  READING ORA THROUGH THIS ADDRESS)
1617
1618                            ;THE BIT ASSIGNMENTS ARE THE SAME AS FOR "VIAMS" ABOVE.
1619
1620
1621
```

```
1622                            .SBTTL  REGISTER DEFINITIONS -- MISC
1623
1624                            ;;*****************************************************************************
1625                            ;* SWITCH PACKS
1626                            ;;*****************************************************************************
1627
1628            121000          SWPBOT  = 121000                ;"BOOT ADDRESS" SWITCH PACK [A200]
1629            121400          SWPDDCMP = 121400               ;"DDCMP ADDRESS" SWITCH PACK [A300]
1630
1631                            ;MISCELLANEOUS EQUATES
1632
1633            100000          TCCHEK  = BIT15         ;FLAG TO REQUEST M3254,5 CHECK
1634            001000          RAMADR  = 001000        ;STARTING ADRS OF RAM PAGE 2 (ADRS 0200 HEX)
1635
1636            000002          EIAV35  = BIT1                  ;SELECT V.35 OR EIA 423/232C
1637            000001          INTGRL  = BIT0                  ;SELECT INTEGRAL MODEM
1638
1639            040000          NORXEN  = BIT14         ;KILL RXEN DURING "INITRN"
1640            001000          NOLOOP  = BIT9          ;KILL TTLOOP DURING "INITRN"
1641
1642            000200          NCTBMT  = BIT7          ;DISABLE INITIAL TBMT=0 CHECK IN TXCHAR
1643
1644            100000          NOCRDA  = BIT15         ;DISABLE INITIAL RDA=0 CHECK IN RXCHAR
1645            040000          NFCRDA  = BIT14         ;DISABLE FINAL RDA=1 CHECK IN RXCHAR
1646            020000          NCRACT  = BIT13         ;DISABLE RXACT=1 CHECK AFTER CLOCKING (RXCHAR)
1647
```

```
                        .SBTTL  GLOBAL DATA SECTION

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

                        ;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                        ; CONTROL BLOCK FOR STACKED ERROR MESSAGES
                        ;---++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

                                ERRTBL
002172                                                          L$ERRTBL::
002172
002172  000000          ERRTYP::        .WORD   0
002174  000000          ERR@R::         .WORD   0
002176  000000          ERRMSG::        .WORD   0
002200  000000          ERRBLK::        .WORD   0

                        ;;++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                        ;+ STORAGE FOR DEVICE REGISTERS
                        ;;++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
002202                  WSR0:                           ;STORAGE FOR DEVICE CSR REGISTERS
002202  000000          BSR0:   .WORD   0
002204                  WSR2:
002204  000000          BSR1:   .WORD   0
002206                  WSR4:
002206  000000          BSR2:   .WORD   0
002210                  WSR6:
002210  000000          BSR3:   .WORD   0
002212                  WSR10:
002212  000000          BSR4:   .WORD   0
002214                  WSR12:
002214  000000          BSR5:   .WORD   0
002216                  WSR14:
002216  000000          BSR6:   .WORD   0
002220                  WSR16:
002220  000000          BSR7:   .WORD   0
002222  000000          BSR10:  .WORD   0
002224  000000          BSR11:  .WORD   0
002226  000000          BSR12:  .WORD   0
002230  000000          BSR13:  .WORD   0
002232  000000          BSR14:  .WORD   0
002234  000000          BSR15:  .WORD   0
002236  000000          BSR16:  .WORD   0
002240  000000          BSR17:  .WORD   0

002242  000010          UREGS:  .BLKW   8.      ;THE FIRST 7 ARE FOR THE USYRT'S ACTUAL
                                                ;REGISTERS.  THE LAST ONE IS FOR THE STATUS
                                                ;REG. (USTATR).
002262  000020          VREGS:  .BLKW   16.     ;STORAGE FOR VIA REGISTERS FOR PRINTOUT
```

```
1698                            ;*****************************************************************************
1699                            ;* MISCELLANEOUS STORAGE
1700                            ;*****************************************************************************
1701  002322  000000  TDATA:  .WORD   0             ;TEST DATA
1702  002324  000000  GDATA:  .WORD   0             ;GOOD DATA
1703  002326  000000  BDATA:  .WORD   0             ;BAD DATA
1704  002330  000000  XDATA:  .WORD   0             ;EXCLUSIVE-OR BETWEEN GOOD AND BAD DATA
1705  002332  000000  SCRACH: .WORD   0             ;GEN'L PURPOSE SCRATCH WORD
1706  002334  000000  LOGDEV: .WORD   0             ;LOGICAL DEVICE NUMBER
1707  002336  000000  REGNUM: .WORD   0             ;CONTAINS A DEVICE REGISTER NUMBER
1708  002340  000000  PSTACK: .WORD   0             ;CONTAINS BASE LEVEL PROGRAM STACK POINTER
1709  002342  000000  PRIOR:  .WORD   0             ;CPU PRIORITY FOR PRINTOUT
1710  002344  000000  SUBRPC: .WORD   0             ;PC OF SUBR CALL FOR ERROR REPORTS
1711  002346  000000  INTFLG: .WORD   0             ;INTERRUPT RECEIVED FLAGS
1712                                                ;  BIT 0 FOR TX, BIT 1 FOR RCV
1713  002350  000000  ERRFLG: .WORD   0             ;SUBROUTINE ERROR FLAG
1714  002352  000000  TIMFLG: .WORD   0             ;EVENT TIME-OUT FLAG
1715  002354  000000  RETADR: .WORD   0             ;SUBR ERROR RETURN ADDRESS
1716  002356  000000  REDBYT: .WORD   0             ;LO BYTE CONTAINS BYTE READ FROM LU REG
1717  002360  000000  WRIBYT: .WORD   0             ;LO BYTE CONTAINS BYTE TO LOAD INTO LU REG
1718  002362  000000  LOADAT: .WORD   0             ;CONTAINS TEST DATA LOADED INTO REG
1719  002364  000000  GOODAT: .WORD   0             ;STORAGE FOR EXPECTED DATA
1720  002366  000000  BADDAT: .WORD   0             ;STORAGE FOR ACTUAL DATA
1721  002370  000000  FRSTIM: .WORD   0             ;FLAG=0 IF PROGRAM JUST LOADED
1722  002372  000000  SAVE4:  .WORD   0             ;SAVE LOC 4 HERE (ERROR TRAP VECTOR)
1723  002374  000000  SAVE6:  .WORD   0             ;SAVE LOC 6 HERE (ERROR TRAP VECTOR)
1724  002376  000000  ERROR1: .WORD   0             ;SUBR ERR. BIT FLAGS (DEF'D IN GLOBAL EQUATES)
1725  002400  000000  CHPTYP: .WORD   0             ;USYRT CHIP TYPE, =0 FOR SMC, ELSE =1
1726  002402  000000  SAVLEN: .WORD   0             ;SAVED TX AND RCV CHAR LENGTHS
1727  002404  000000  DEVMAP: .WORD   0             ;BIT MAP OF ACTIVE DEVICES
1728  002406  000000  DEVPTR: .WORD   0             ;DEVICE MAP BIT POINTER
1729  002410  000000  UNIT:   .WORD   0             ;CONTAINS UNIT NO. (1 TO N)
1730  002412  000000  STARES: .WORD   0             ;FLAG TO SHOW NO. OF PASSES SINCE STA OR RES
1731  002414  000000  TSTNUM: .WORD   0             ;NO. OF CURRENT TEST (FOR SOME TESTS)
1732
```

```
1733
1734  002416
1735  002416
1736  002416  160020          ;;********** CURRENT DEVICE PARAMETERS **************
                              BSEL0:
                              SEL0:
                              MPCSR:  .WORD   160020          ;POINTER TO DMV11 CSR'S
1737  002420  160021          BSEL1:  .WORD   160021          ;POINTER TO BSEL1
1738  002422                  BSEL2:
1739  002422  160022          SEL2:   .WORD   160022          ;POINTER TO SEL2
1740  002424  160023          BSEL3:  .WORD   160023          ;POINTER TO BSEL3
1741  002426                  BSEL4:
1742  002426  160024          SEL4:   .WORD   160024          ;POINTER TO SEL4
1743  002430  160025          BSEL5:  .WORD   160025          ;POINTER TO BSEL5
1744  002432                  BSEL6:
1745  002432  160026          SEL6:   .WORD   160026          ;POINTER TO SEL6
1746  002434  160027          BSEL7:  .WORD   160027          ;POINTER TO BSEL7
1747  002436                  BSEL10:
1748  002436  160030          SEL10:  .WORD   160030          ;POINTER TO SEL10
1749  002440  160031          BSEL11: .WORD   160031          ;POINTER TO BSEL11
1750  002442                  BSEL12:
1751  002442  160032          SEL12:  .WORD   160032          ;POINTER TO SEL12
1752  002444  160033          BSEL13: .WORD   160033          ;POINTER TO BSEL13
1753  002446                  BSEL14:
1754  002446  160034          SEL14:  .WORD   160034          ;POINTER TO SEL14
1755  002450  160035          BSEL15: .WORD   160035          ;POINTER TO BSEL15
1756  002452                  BSEL16:
1757  002452  160036          SEL16:  .WORD   160036          ;POINTER TO SEL16
1758  002454  160037          BSEL17: .WORD   160037          ;POINTER TO BSEL17
1759
1760  002456  000300          MPIVEC: .WORD      300          ;DMV11 INPUT INTERRUPT VECTOR
1761  002460  000304          MPOVEC: .WORD      304          ;DMV11 OUTPUT INTERRUPT VECTOR
1762  002462  000240          MPRIOR: .WORD      240          ;DMV11 DEVICE PRIORITY
1763  002464  000000          LUSWI1: .WORD        0          ;LINE UNIT SWITCH PACK #1
1764  002466  000000          LUSWI2: .WORD        0          ;LINE UNIT SWITCH PACK #2
1765  002470  000000          BRDTYP: .WORD        0          ;0-M8064, 1-M8053/V.35,2-M8053/EIA
1766  002472  000000          TSTCON: .WORD        0          ;TEST CONNECTOR INDICATOR
1767  002474  000001          BDRATE: .WORD        1          ;BAUD RATE = 56 K
1768                                                          ;        0 = 19.2 K
1769                                                          ;        1 = 56 K
```

```
1770
1771  002476  120400                  USYREG: .WORD   120400          ;ADDRESS OF RDSRL
1772  002500  120401                          .WORD   120401          ;ADDRESS OF RDSRH
1773  002502  120402                          .WORD   120402          ;ADDRESS OF TDSRL
1774  002504  120403                          .WORD   120403          ;ADDRESS OF TDSRH
1775  002506  120404                          .WORD   120404          ;ADDRESS OF PCSARL
1776  002510  120405                          .WORD   120405          ;ADDRESS OF PCSARH
1777  002512  120407                          .WORD   120407          ;ADDRESS OF PCR
1778  002514  122000                          .WORD   122000          ;ADDRESS OF USYRT STATUS REG
1779
1780                                  ;***** STORAGE FOR DATA READ IN ADDRESS TESTS *****
1781  002516  000010                  REDDAT: .BLKB   8.
1782
1783                                  ;;****  GEN'L PURPOSE SCRATCH STORAGE  *****
1784  002526  000000                  REG0:   .WORD   0
1785  002530  000000                  REG1:   .WORD   0
1786  002532  000000                  REG2:   .WORD   0
1787  002534  000000                  REG3:   .WORD   0
1788  002536  000000                  REG4:   .WORD   0
1789  002540  000000                  REG5:   .WORD   0
1790  002542  000000                  REG6:   .WORD   0
1791  002544  000000                  REG7:   .WORD   0
1792
1793                                  ;;****  SCRATCH STORAGE FOR MESSAGE REPORTING   *****
1794  002546  000000                  TMP0:   .WORD   0
1795  002550  000000                  TMP1:   .WORD   0
1796  002552  000000                  TMP2:   .WORD   0
1797  002554  000000                  TMP3:   .WORD   0
1798  002556  000000                  TMP4:   .WORD   0
1799  002560  000000                  TMP5:   .WORD   0
1800  002562  000000                  TMP6:   .WORD   0
1801  002564  000000                  TMP7:   .WORD   0
1802
1803                                  ;***** UNBUS LU REG BIT MASKS FOR UNPREDICTABLE BITS *****
1804  002566                          UPBITS:
1805  002566      377                         .BYTE   377             ;MASK FOR RDBR
1806  002567      000                         .BYTE   000             ;MASK FOR RDSR
1807  002570      000                         .BYTE   000             ;MASK FOR TDBR
1808  002571      360                         .BYTE   360             ;MASK FOR TDSR
1809  002572      000                         .BYTE   000             ;MASK FOR SSAR
1810  002573      000                         .BYTE   000             ;MASK FOR PCSAR
1811  002574      347                         .BYTE   347             ;MASK FOR PCR
1812
1813  002575      200                 TDSRNRW: .BYTE  200             ;TDSR NON-R/W BITS
```

```
                                .SBTTL  DATA TEST PATTERNS
                                ;***** DATA PATTERN E *****
002576                          PATE:
002576  377                             .BYTE   377
002577  377                             .BYTE   377
002600  377                             .BYTE   377
002601  377                             .BYTE   377
002602  377                             .BYTE   377
002603  377                             .BYTE   377
002604  377                             .BYTE   377
002605  366                             .BYTE   366

                                ;***** DATA PATTERN F *****
002606                          PATF:
002606  000                             .BYTE   000
002607  000                             .BYTE   000
002610  000                             .BYTE   000
002611  000                             .BYTE   000
002612  000                             .BYTE   000
002613  000                             .BYTE   000
002614  000                             .BYTE   000
002615  110                             .BYTE   110

                                ;***** DATA PATTERN G *****
002616                          PATG:
002616  000                             .BYTE   000
002617  001                             .BYTE   001
002620  003                             .BYTE   003
002621  004                             .BYTE   004
002622  005                             .BYTE   005
002623  007                             .BYTE   007
002624  100                             .BYTE   100
002625  101                             .BYTE   101
002626  103                             .BYTE   103
002627  104                             .BYTE   104
002630  105                             .BYTE   105
002631  107                             .BYTE   107
002632  000                             .BYTE   000
002633  017                             .BYTE   017
002634  027                             .BYTE   027
002635  041                             .BYTE   041
002636  200                             .BYTE   200
002637  277                             .BYTE   277
002640  103                             .BYTE   103
002641  144                             .BYTE   144
002642  115                             .BYTE   115
002643  157                             .BYTE   157
002644  000                             .BYTE   000

                                ;***** DATA PATTERN X *****
002645                          PATX:
002645  125                             .BYTE   125
002646  252                             .BYTE   252
002647  000                             .BYTE   000
002650  377                             .BYTE   377
002651  001                             .BYTE   001
```

```
1870  002652  002                    .BYTE   002
1871  002653  004                    .BYTE   004
1872  002654  010                    .BYTE   010
1873  002655  020                    .BYTE   020
1874  002656  040                    .BYTE   040
1875  002657  100                    .BYTE   100
1876  002660  200                    .BYTE   200
1877  002661  376                    .BYTE   376
1878  002662  375                    .BYTE   375
1879  002663  373                    .BYTE   373
1880  002664  367                    .BYTE   367
1881  002665  357                    .BYTE   357
1882  002666  337                    .BYTE   337
1883  002667  277                    .BYTE   277
1884  002670  177                    .BYTE   177
1885
1886  002671  125                    .BYTE   125
1887  002672  252                    .BYTE   252
1888  002673  000                    .BYTE   000
1889  002674  377                    .BYTE   377
1890  002675  001                    .BYTE   001
1891  002676  002                    .BYTE   002
1892  002677  004                    .BYTE   004
1893  002700  010                    .BYTE   010
1894  002701  020                    .BYTE   020
1895  002702  040                    .BYTE   040
1896  002703  100                    .BYTE   100
1897  002704  200                    .BYTE   200
1898  002705  376                    .BYTE   376
1899  002706  375                    .BYTE   375
1900  002707  373                    .BYTE   373
1901  002710  367                    .BYTE   367
1902  002711  357                    .BYTE   357
1903  002712  337                    .BYTE   337
1904  002713  277                    .BYTE   277
1905  002714  177                    .BYTE   177
1906
1907  002715  125                    .BYTE   125
1908  002716  252                    .BYTE   252
1909  002717  000                    .BYTE   000
1910  002720  377                    .BYTE   377
1911  002721  001                    .BYTE   001
1912  002722  002                    .BYTE   002
1913  002723  004                    .BYTE   004
1914  002724  010                    .BYTE   010
1915  002725  020                    .BYTE   020
1916  002726  040                    .BYTE   040
1917  002727  100                    .BYTE   100
1918  002730  200                    .BYTE   200
1919  002731  376                    .BYTE   376
1920  002732  375                    .BYTE   375
1921  002733  373                    .BYTE   373
1922  002734  367                    .BYTE   367
1923  002735  357                    .BYTE   357
1924  002736  337                    .BYTE   337
1925  002737  277                    .BYTE   277
```

```
1926  002740  177                 EPATX:  .BYTE   177
1927
1928                              ;***** DATA PATTERN I *****
1929  002741                      PATI:
1930  002741  000                         .BYTE   000
1931  002742  041                         .BYTE   041
1932  002743  102                         .BYTE   102
1933  002744  143                         .BYTE   143
1934  002745  204                         .BYTE   204
1935  002746  245                         .BYTE   245
1936  002747  306                         .BYTE   306
1937  002750  347                         .BYTE   347
1938  002751  000                         .BYTE   000
1939  002752  001                         .BYTE   001
1940  002753  002                         .BYTE   002
1941  002754  004                         .BYTE   004
1942  002755  040                         .BYTE   040
1943  002756  100                         .BYTE   100
1944  002757  200                         .BYTE   200
1945  002760  000                         .BYTE   000
1946  002761  346                         .BYTE   346
1947  002762  345                         .BYTE   345
1948  002763  343                         .BYTE   343
1949  002764  307                         .BYTE   307
1950  002765  247                         .BYTE   247
1951  002766  147                         .BYTE   147
1952  002767  347                         .BYTE   347
1953  002770  242                         .BYTE   242
1954  002771  105                         .BYTE   105
1955  002772  347                         .BYTE   347
1956  002773  010                         .BYTE   010
1957  002774  020                         .BYTE   020
1958  002775  367                         .BYTE   367
1959  002776  357                         .BYTE   357
1960  002777  030                         .BYTE   030
1961  003000  027                         .BYTE   027
1962  003001  377                         .BYTE   377
1963
1964                              ;***** DATA PATTERN J *****
1965  003002                      PATJ:
1966  003002  000                         .BYTE   000
1967  003003  000                         .BYTE   000
1968  003004  001                         .BYTE   001
1969  003005  002                         .BYTE   002
1970  003006  004                         .BYTE   004
1971  003007  020                         .BYTE   020
1972  003010  040                         .BYTE   040
1973  003011  010                         .BYTE   010
1974
1975                              ;***** DATA PATTERN K *****
1976  003012                      PATK:
1977  003012  000                         .BYTE   000
1978  003013  377                         .BYTE   377
1979  003014  376                         .BYTE   376
1980  003015  375                         .BYTE   375
1981  003016  373                         .BYTE   373
```

```
1982  003017  376                    .BYTE   376
1983  003020  177                    .BYTE   177
1984  003021  377                    .BYTE   377
1985  003022  000                    .BYTE   000
1986  003023  001                    .BYTE   001
1987  003024  002                    .BYTE   002
1988  003025  004                    .BYTE   004
1989  003026  010                    .BYTE   010
1990  003027  200                    .BYTE   200
1991  003030  125                    .BYTE   125
1992  003031  252                    .BYTE   252
1993  003032  000                    .BYTE   000
1994
1995                                 ;***** DATA PATTERN L *****
1996  003033                         PATL:
1997  003033  000                    .BYTE   000
1998  003034  017                    .BYTE   017
1999  003035  016                    .BYTE   016
2000  003036  015                    .BYTE   015
2001  003037  013                    .BYTE   013
2002  003040  016                    .BYTE   016
2003  003041  017                    .BYTE   017
2004  003042  017                    .BYTE   017
2005  003043  000                    .BYTE   000
2006  003044  001                    .BYTE   001
2007  003045  002                    .BYTE   002
2008  003046  004                    .BYTE   004
2009  003047  010                    .BYTE   010
2010  003050  000                    .BYTE   000
2011  003051  005                    .BYTE   005
2012  003052  012                    .BYTE   012
2013  003053  000                    .BYTE   000
```

```
2014
2015                                    ;***** DATA PATTERN Q *****
2016  003054  000                       PATQ:   .BYTE   000
2017  003055  002                               .BYTE   002
2018  003056  014                               .BYTE   014
2019  003057  060                               .BYTE   060
2020  003060  001                               .BYTE   001
2021  003061  007                               .BYTE   007
2022  003062  037                               .BYTE   037
2023  003063  177                               .BYTE   177
2024
2025
2026  003064                            ENDPAT:
2027                                    .EVEN
```

```
2028
2029
2030
2031                                    ;*** RECEIVED DATA BUFFER (64. WORDS) ***
2032  003064  000100                    RCVBUF: .BLKW   64.
2033
2034
2035
2036
```

```
                                .SBTTL  GLOBAL TEXT SECTION

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

                                ;;*************************************************************
                                ;* NAMES OF DEVICES SUPPORTED BY PROGRAM
                                ;;*************************************************************
                                        DEVTYP  <M8053 OR M8064>
                                                                        L$DVTYP::
003264                                                                          .ASCIZ  /M8053 OR M8064/
003264  034115  032460  020063
003272  051117  046440  030070
003300  032066     000
        003304                                                          .EVEN

                                ;;*************************************************************
                                ;* TITLE OF PROGRAM
                                ;;*************************************************************

        000012                  .RADIX  10.
                                        DESCRIPT        <DMV-11 LINE UNIT TESTS - PART 3 OF 3>
003304                                                                  L$DESC::
003304                                                                          .ASCIZ  /DMV-11 LINE UNI
003304  046504  026526  030461
003312  046040  047111  020105
003320  047125  052111  052040
003326  051505  051524  026440
003334  050040  051101  020124
003342  020063  043117  031440
003350     000
        003352                                                          .EVEN
        000010                  .RADIX  8.
```

```
                                .SBTTL  GLOBAL SUBROUTINE SECTION


                                .SBTTL ....M-LOOP -- MSTCLR -- MASTER CLEAR AND 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>
                                ;
                                ;--**********************************************************************

003352  112777  000301  177040  MSTCLR: MOVB    @#RUN!MCLR!MREQ,@#BBSEL1    ;INITIATE M-LOOP

003360  010346                          MOV     R3,-(SP)
003362  012703  001000                  MOV     #512.,R3                    ;WAIT FOR THE M-LOOP TO FINISH THE OPERATION
003366  077301                  1$:     SOB     R3,1$
003370  012603                          MOV     (SP)+,R3

003372  132777  000200  177022          BITB    @#MRDY,@#BBSEL2     ;DID THE M-LOOP FINISH
003400  001023                          BNE     5$                  ;YES.  GOOD.  RETURN
003402  004737  004166                  JSR     PC,GETWSR           ;GET BYTE SELECT REGISTERS
003406  012737  000301  002324          MOV     #RUN!MCLR!MREQ,@#DATA    ;IDENTIFY REQUESTED FUNCTION
003414                                  GTDF    EM3,ERR4            ;"MRDY" TIMEOUT
                                        ;       QUEUE "DEVICE FATAL" ERROR # 1
003414  012737  000001  002172                                              MOV     #T.EDF,ERRTYP
003422  012737  000001  002174                                              MOV     #1,ERRNBR
003430  012737  014263  002176                                              MOV     #EM3,ERRMSG
003436  012737  020120  002200                                              MOV     #ERR4,ERRBLK
003444  000261                          SEC                 ;SET CARRY TO INDICATE ERROR
003446  000401                          BR      9$          ;EXIT WITH THE "ERROR" FLAG (CARRY BIT) SET
003450  000241                  5$:     CLC                 ;CLEAR C BIT FOR NO ERRORS
003452  000207                  9$:     RTS     PC          ;RETURN
```

```
2119                                    .SBTTL ....M-LOOP -- READ
2120                                    ;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
2121                                    ; READ - READ THE SPECIFIED ADDRESS WITHIN THE DMV-11 (M8053)
2122                                    ;
2123                                    ;  CALLING SEQUENCE:
2124                                    ;
2125                                    ;       JSR     R5,READ
2126                                    ;       .WORD   <ADDRESS OF REGISTER WITHIN DMV-11>
2127                                    ;       .WORD   <DESTINATION ADDRESS WITHIN LSI-11>
2128                                    ;       BCC     N$                  ;IF NO ERROR OCCURED, PROCEED WITH ROUTINE
2129                                    ;       ERROR                       ;AN ERROR MESSAGE HAS BEEN STACKED:  PRINT IT
2130                                    ;       <ANY OTHER SPECIAL ERROR PROCESSING MAY BE DONE HERE  (I.E. CKLOOP)>
2131                                    ;
2132                                    ; N$:   <RESUMPTION OF NORMAL PROCESSING>
2133                                    ;
2134                                    ;--------------------------------------------------------------------------------------------
2135
2136  003454  012577  176746           READ:   MOV     (R5)+,@SEL4         ;SETUP SOURCE POINTER
2137  003460  112777  000001  176734           MOVB    #REDLOC,@BSEL2      ;TELL M-LOOP TO GIVE US THE REQUESTED DATA
2138
2139  003466  010346                           MOV     R3,-(SP)
2140  003470  012703  001000                   MOV     #512.,R3                    ;WAIT FOR THE M-LOOP TO FINISH THE OPERATION
2141  003474  077301                   1$:     SOB     R3,1$
2142  003476  012603                           MOV     (SP)+,R3
2143
2144  003500  132777  000200  176714           BITB    #RDY,@BSEL2         ;DID THE M-LOOP FINISH
2145  003506  001023                           BNE     5$                  ;YES,  GOOD.  RETURN
2146
2147  003510  004737  004166                   JSR     PC,GETWSR           ;GET BYTE SELECT REGISTERS
2148  003514  012737  000001  002324           MOV     #REDLOC,GDATA       ;IDENTIFY REQUESTED FUNCTION
2149  003522                                   GTDF    EM4,ERR4            ;"RDY" TIMEOUT
2150                                                                       ;       QUEUE "DEVICE FATAL" ERROR # 2
2151  003522  012737  000001  002172                                                   MOV     #T.EDF,ERRTYP
2152  003530  012737  000002  002174                                                   MOV     #2,ERRNBR
2153  003536  012737  014307  002176                                                   MOV     #EM4,ERRMSG
2154  003544  012737  020120  002200                                                   MOV     #ERR4,ERRBLK
2155  003552  000261                           SEC                         ;INDICATE AN ERROR HAS BEEN STACKED
2156  003554  000401                           BR      6$                  ;RETURN WITH THAT INDICATION
2157
2158  003556  000241                   5$:     CLC                         ;INDICATE "NO ERROR"
2159  003560  117735  176646           6$:     MOVB    @BSEL6,@(R5)+       ;PUT DATA WHERE CALLER WANTS IT
2160  003564  000205                           RTS     R5                  ;RETURN
2161
2162
2163
2164
```

```
                                .SBTTL ....M-LOOP -- READ IMMEDIATE
                                ;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                                ; READI - READ IMMEDIATE THE SPECIFIED ADDRESS WITHIN THE DMV-11 (M8053)
                                ;
                                ; 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>
                                ;
                                ;--++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                                READI:
003566  012577  176634                  MOV     (R5)+,@SEL4     ;SETUP SOURCE POINTER
003572  112777  000001  176622          MOVB    #REDLOC,@SEL2   ;TELL M-LOOP TO GIVE US THE REQUESTED DATA
                                
003600  010346                          MOV     R3,-(SP)
003602  012703  001000                  MOV     #512.,R3                ;WAIT FOR THE M-LOOP TO FINISH THE OPERATION
003606  077301                  1$:     SOB     R3,1$
003610  012603                          MOV     (SP)+,R3
                                
003612  132777  000200  176602          BITB    #RDY,@SEL2      ;DID THE M-LOOP FINISH
003620  001023                          BNE     5$              ;YES,  GOOD.  RETURN
                                
003622  004737  004166                  JSR     PC,GETMSR       ;GET BYTE SELECT REGISTERS
003626  012737  000001  002324          MOV     #REDLOC,GDATA   ;IDENTIFY REQUESTED FUNCTION
003634                                  GTDF    EM4,ERR4        ;"RDY" TIMEOUT
                                                                ;       QUEUE "DEVICE FATAL" ERROR # 3
003634  012737  000001  002172                                                  MOV     #T.EDF,ERRTYP
003642  012737  000003  002174                                                  MOV     #3,ERRNBR
003650  012737  014307  002176                                                  MOV     #EM4,ERRMSG
003656  012737  020120  002200                                                  MOV     #ERR4,ERRBLK
003664  000261                          SEC                     ;INDICATE AN ERROR HAS BEEN STACKED
003666  000401                          BR      6$              ;RETURN WITH THAT INDICATION
                                
003670  000241                  5$:     CLC                     ;INDICATE "NO ERROR"
003672  017725  176534          6$:     MOV     @SEL6,(R5)+     ;PUT DATA WHERE CALLER WANTS IT
003676  000205                          RTS     R5              ;RETURN
```

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

003700  012577  176522          WRITE:  MOV     (R5)+,@SEL4     ;SETUP SOURCE POINTER
003704  113577  176522                  MOVB    @(R5)+,@SEL6    ;MAKE DATA AVAILABLE TO M-LOOP
003710  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     N0              ;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)>
                        ;
                        ; N0:   <RESUMPTION OF NORMAL PROCESSING>
                        ;
                        ;--**********************************************************************

003712                  WRITEI:
003712  012577  176510          MOV     (R5)+,@SEL4     ;SETUP SOURCE POINTER
003716  012577  176510          MOV     (R5)+,@SEL6     ;MAKE DATA AVAILABLE TO M-LOOP
003722  112777  000002  176472  MLWRI:  MOVB    @WRILOC,@BSEL2  ;TELL M-LOOP TO WRITE THE DATA

003730  010346                  MOV     R3,-(SP)
003732  012703  001000          MOV     #512.,R3                ;WAIT FOR THE M-LOOP TO FINISH THE OPERATION
003736  077301                  10:     SOB     R3,10
003740  012603                  MOV     (SP)+,R3

003742  132777  000200  176452  BITB    @#RDY,@BSEL2    ;DID THE M-LOOP FINISH
003750  001023                  BNE     50              ;YES.  GOOD.  RETURN
003752  004737  004166          JSR     PC,GETWSR       ;GET BYTE SELECT REGISTERS
003756  012737  000002  002324  MOV     @WRILOC,GDATA   ;IDENTIFY REQUESTED FUNCTION
003764                          GTDF    EM4,ERR4        ;"RDY" TIMEOUT
                                ;       QUEUE "DEVICE FATAL" ERROR # 4
003764  012737  000001  002172                                  MOV     #T.EDF,ERRTYP
003772  012737  000004  002174                                  MOV     #4,ERRNBR
004000  012737  014307  002176                                  MOV     #EM4,ERRMSG
004006  012737  020120  002200                                  MOV     #ERR4,ERRBLK
004014  000261                  SEC                     ;INDICATE AN ERROR HAS BEEN STACKED
004016  000401                  BR      60              ;RETURN WITH THAT INDICATION

004020  000241          50:     CLC                     ;INDICATE "NO ERROR"
004022  000205          60:     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
                                ;
                                ;--*************************************************************************

004024  117737  176366  002202  GETBSR: MOVB    @#SEL0,BSR0     ;PUT THE CURRENT CSR VALUES INTO THE PRINT-OUT
004032  117737  176362  002204          MOVB    @#SEL1,BSR1     ;TABLE
004040  117737  176356  002206          MOVB    @#SEL2,BSR2
004046  117737  176352  002210          MOVB    @#SEL3,BSR3
004054  117737  176346  002212          MOVB    @#SEL4,BSR4
004062  117737  176342  002214          MOVB    @#SEL5,BSR5
004070  117737  176336  002216          MOVB    @#SEL6,BSR6
004076  117737  176332  002220          MOVB    @#SEL7,BSR7
004104  117737  176326  002222          MOVB    @#SEL10,BSR10
004112  117737  176322  002224          MOVB    @#SEL11,BSR11
004120  117737  176316  002226          MOVB    @#SEL12,BSR12
004126  117737  176312  002230          MOVB    @#SEL13,BSR13
004134  117737  176306  002232          MOVB    @#SEL14,BSR14
004142  117737  176302  002234          MOVB    @#SEL15,BSR15
004150  117737  176276  002236          MOVB    @#SEL16,BSR16
004156  117737  176272  002240          MOVB    @#SEL17,BSR17
004164  000207                          RTS     PC              ;RETURN TO CALLER

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

004166  017737  176224  002202  GETWSR: MOV     @SEL0,WSR0      ;MOVE THE 4 WORD REGISTERS TO THE OTHERWISE
004174  017737  176222  002204          MOV     @SEL2,WSR2      ;BYTE TABLE
004202  017737  176220  002206          MOV     @SEL4,WSR4
004210  017737  176216  002210          MOV     @SEL6,WSR6
004216  017737  176214  002212          MOV     @SEL10,WSR10
004224  017737  176212  002214          MOV     @SEL12,WSR12
004232  017737  176210  002216          MOV     @SEL14,WSR14
004240  017737  176206  002220          MOV     @SEL16,WSR16
004246  000207                          RTS     PC              ;RETURN TO CALLER
```

```
                        .SBTTL ....STUREG -- STATIC TEST OF SPECIFIED USYRT REGISTER
                        ;+**********************************************************************
                        ; STUREG -- PERFORM A STATIC TEST OF THE SPECIFIED USYRT REGISTER
                        ;
                        ; CALLING SEQUENCE:
                        ;
                        ;       <R0 CONTAINS THE ADDRESS OF THE REGISTER TO BE TESTED>
                        ;       <"TDATA" CONTAINS THE TEST BYTE>
                        ;       <"GDATA" CONTAINS THE EXPECTED DATA>
                        ;       <"REGNUM" CONTAINS REG INDEX FOR POSSIBLE ERRORS>
                        ;
                        ;       JSR     PC,STUREG
                        ;       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>
                        ;
                        ;--**********************************************************************

004250  010037  004264  STUREG: MOV     R0,2$           ;PUT SPECIFIED REGISTER'S ADDRESS IN I/O CALLS
004254  010037  004302          MOV     R0,4$

004260  004537  003700          JSR     R5,WRITE        ;WRITE IT
004264  000000          2$:     .WORD   0               ;*** MODIFIED FROM ABOVE ***
004266  002322                  .WORD   TDATA           ;
004270  103431                  BCS     10$             ;ON ERROR, EXIT

004272  005037  002326          CLR     BDATA           ;CLEAR BOTH BYTES -- JUST IN CASE....
004276  004537  003454          JSR     R5,READ         ;READ IT BACK AGAIN
004302  000000          4$:     .WORD   0               ;*** MODIFIED FROM ABOVE ***
004304  002326                  .WORD   BDATA
004306  103422                  BCS     10$             ;ON ERROR, EXIT

004310  123737  002324  002326  CMPB    GDATA,BDATA     ;DID WE READ WHAT WE WROTE?
004316  000241                  CLC                     ; (THIS ISN'T NEEDED FOR THE ERROR TEST BUT
                                                        ; MUST BE CLEARED ON EXIT IF NO ERROR OCCURED)
004320  001415                  BEQ     10$             ;YES, EXIT FROM SUBTEST
004322                          GTDF    EM25,ERR7A      ;REPORT READ/WRITE ERROR
                                                        ;       QUEUE "DEVICE FATAL" ERROR # 5
004322  012737  000001  002172                                  MOV     #T.EDF,ERRTYP
004330  012737  000005  002174                                  MOV     #5,ERRNBR
004336  012737  014360  002176                                  MOV     #EM25,ERRMSG
004344  012737  020244  002200                                  MOV     #ERR7A,ERRBLK
004352  000261                  SEC                     ;INDICATE THAT AN ERROR WAS DETECTED
004354  000207          10$:    RTS     PC
```

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

004356  000207          STALL:  RTS     PC
```

```
                                        .SBTTL

                                        ;*******************************************************************************
                                        ;* GETURS - LOAD INTO THE 8 WORD STORAGE AREA (UREGS) THE CONTENTS OF THE
                                        ;*      VARIOUS USYRT REGISTERS
                                        ;*
                                        ;*        CALLING SEQUENCE:
                                        ;*
                                        ;*******************************************************************************
004360  012737  002242  004422  GETURS: MOV     #UREGS,5$       ;INIT POINTER TO REG STORAGE TABLE
004366  012737  120400  004420           MOV     #USYRT,4$       ;INIT POINTER TO REGISTER ADDRESSES

004374  005037  002260                   CLR     UREGS+14.       ;CLEAR STORAGE WORD
004400  004537  003454                   JSR     R5,READ         ;READ THE USYRT STATUS REGISTER
004404  122000                           .WORD   USTATR          ;STATUS REGISTER'S ADDRESS WITHIN DMV-11
004406  002260                           .WORD   UREGS+14.       ;ADDRESS ALLOCATED TO THAT REG. W/IN "UREGS"

004410  005077  000006          3$:      CLR     @5$             ;CLEAR STORAGE WORD
004414  004537  003454                   JSR     R5,READ         ;READ A LINE UNIT REG
004420  000000                  4$:      .WORD   0               ;REGISTER ADDRESS GOES HERE
004422  000000                  5$:      .WORD   0               ;STORAGE ADRS IN TABLE GOES HERE

004424  005237  004420          6$:      INC     4$              ;INCREMENT REG NO.
004430  023727  004420  120406           CMP     4$,#USYRT+6     ;THIS IS NOT A VALID REGISTER ADDRESS
004436  001772                           BEQ     6$              ;SO IT MUST BE BYPASSED

004440  062737  000002  004422           ADD     #2,5$           ;ADVANCE ADDRESS OF STORAGE AREA POINTER
004446  023727  004420  120410           CMP     4$,#USYRT+10    ;SEE IF ALL REGS READ YET
004454  001355                           BNE     3$              ;BR IF NOT

004456  000207                           RTS     PC              ;RETURN


                                        ;*******************************************************************************
                                        ;* GETVRS: - LOAD INTO THE 16 WORD STORAGE AREA (VREGS) THE CONTENTS OF THE
                                        ;*      VARIOUS VIA REGISTERS.
                                        ;*
                                        ;*      CALLING SEQUENCE :
                                        ;*******************************************************************************
004460  012737  002262  004506  GETVRS: MOV     #VREGS,5$       ;INIT POINTER TO REG STORAGE TABLE
004466  012737  120000  004504           MOV     #VIA,4$         ;INIT POINTER TO REGISTER ADDRESSES
004474  005077  000006          3$:      CLR     @5$             ;CLEAR STORAGE WORD
004500  004537  003454                   JSR     R5,READ         ;READ A VIA REG
004504  000000                  4$:      .WORD   0               ;REGISTER ADDRESS GOES HERE
004506  000000                  5$:      .WORD   0               ;STORAGE ADRS IN TABLE GOES HERE
004510  005237  004504          6$:      INC     4$              ;INCREMENT REG NO.
004514  062737  000002  004506           ADD     #2,5$           ;INCREMENT STORAGE ADRS
004522  023727  004504  120020           CMP     4$,#VIA+16.     ;SEE IF ALL VIA REGS READ YET
004530  001361                           BNE     3$              ;BR IF NOT
004532  000207                           RTS     PC              ;RETURN
```

```
                        .SBTTL ....INITT1 -- INITIALIZE TIMER #1
                        ;**************************************************************************
                        ;* INITT1 - INITIALIZE TIMER # 1
                        ;*
                        ;*       CALLING SEQUENCE:
                        ;*
                        ;*            JSR     R5,INITT1
                        ;*            .WORD   <VALUE LOADED INTO THE T1 LATCH @ VIAT1C & VIAT1D>
                        ;*            .WORD   <VALUE LOADED INTO "T1L-L" & "T1C-H">
                        ;*            .BYTE   <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")>
                        ;*            .BYTE   <UNUSED>
                        ;*
                        ;* NOTE:
                        ;*
                        ;* BEFORE LOADING AND STARTING THE COUNTER, THE LATCH REGISTER (ACCESSED THRU
                        ;* "VIAT1C") IS LOADED.  THEN, T1L-L IS LOADED AND NEXT, T1C-H.  THIS LAST
                        ;* LOAD WILL RESET THE TIMEOUT BIT AND COUNTER LOGIC.  IT IS EXPECTED AT THIS
                        ;* TIME (5/25/79) THAT THE INTERRUPT FACILITY OF THE VIA CHIP WILL NOT BE USED
                        ;* -- HOWEVER, ACCESS TO THE INTENRUPT ENABLE BIT IS GIVEN THROUGH THE THIRD
                        ;* PARAMETER IN THE CALLING SEQUENCE (BIT 5 = 0 WILL CAUSE THIS ROUTINE TO
                        ;* CLEAR THE ENABLE BIT ("T1") IN "IER".)
                        ;*
                        ;**************************************************************************

004534  010146          INITT1: MOV     R1,-(SP)        ;SAVE THE REGISTER WE WILL BE USING
004536  012537  004660          MOV     (R5)+,7$        ;SETUP VALUE TO BE WRITTEN IN LATCH
004542  012537  004706          MOV     (R5)+,10$       ;SETUP VALUE TO BE WRITTEN IN COUNTER
004546  111501                  MOVB    (R5),R1         ;GET & PROCESS BITS FOR ACR 6 & 7
004550  143701  000077          BICB    077,R1
004554  010137  004650          MOV     R1,4$           ;SETUP CALL SET ACR'S BITS 6 & 7
004560  112501                  MOVB    (R5)+,R1        ;NOW, GET THE BIT TO BE USED IN SETTING OR
                                                        ;CLEARING BIT 6 OF "IER"
004562  106301                  ASLB    R1              ;THE PASSED BIT IS IN THE WRONG POSITION
004564  106301                  ASLB    R1              ;BUT, THE PASSED BIT 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).
004566  143701  000177          BICB    177,R1          ;FIRST, MAKE SURE ALL UNWANTED BITS ARE CLEARED
004572  153701  000100          BISB    100,R1          ;THEN SET BIT 6
004576  010137  004610          MOV     R1,2$           ;THE CALL WILL NOW WRITE THE APPROPRIATE VALUE

004602  004537  003712          JSR     R5,WRITEI       ;WRITE TO
004606  120016                  VIAIER                  ;THE VIA'S IER
004610  000000          2$:     .WORD   0               ;INTERRUPT ENABLE/DISABLE INFORMATION

004612  004537  003566          JSR     R5,READI        ;READ THE CURRENT SETTING OF
004616  120013                  VIAACR                  ;THE VIA'S ACR
004620  000000          3$:     .WORD   0               ;INTO "3$"

004622  013701  004620          MOV     3$,R1           ;GET THAT VALUE
004626  143701  000300          BICB    300,R1          ;CLEAR THE CURRENT SETTING OF BITS 6 & 7
004632  053701  004650          BIS     4$,R1           ;SET THEM ACCORDING TO THE PASSED VALUES
```

```
2492  004636  010137  004650                  MOV     R1,4$           ;PASS THE NEW REG. SETTING TO APPROPRIATE CALL
2493
2494  004642  004537  003712                  JSR     R5,WRITEI       ;WRITE TO
2495  004646  120013                          VIAACR                  ;THE VIA'S ACR
2496  004650  000000                  4$:     .WORD   0               ;THE NEW REGISTER SETTING
2497
2498  004652  004537  003712                  JSR     R5,WRITEI       ;WRITE TO
2499  004656  120006                          VIAT1C                  ;LOW ORDER LATCH REGISTER (T1L-L)
2500  004660  000000                  7$:     .WORD   0               ;THE VALUE PASSED
2501
2502  004662  113737  004661  004676          MOVB    7$+1,8$         ;SETUP FOR AND
2503  004670  004537  003712                  JSR     R5,WRITEI       ;WRITE TO
2504  004674  120007                          VIAT1D                  ;HIGH ORDER LATCH REGESTER (T1L-H)
2505  004676  000000                  8$:     .WORD   0               ;THE VALUE PASSED
2506
2507  004700  004537  003712                  JSR     R5,WRITEI       ;WRITE TO
2508  004704  120004                          VIAT1A                  ;LOW ORDER LATCH & COUNTER (T1L-L & T1C-L)
2509  004706  000000                  10$:    .WORD   0               ;THE VALUE PASSED
2510
2511  004710  113737  004707  0J4724          MOVB    10$+1,11$       ;SETUP FOR AND
2512  004716  004537  003712                  JSR     R5,WRITEI       ;WRITE TO
2513  004722  120005                          VIAT1B                  ;HIGH ORDER COUNTER (T1C-H) <ALSO STARTS CTR>
2514  004724  000000                  11$:    .WORD   0               ;THE VALUE PASSED
2515
2516                                  ; DON'T WAIT AROUND FOR ANYTHING TO HAPPEN -- JUST (JEST) RETURN!
2517
2518  004726  012601                          MOV     (SP)+,R1        ;BUT FIRST RESTORE R1
2519  004730  005205                          INC     R5              ;AND PUT R5 BACK ON A WORD BOUNDRY (THE LAST
2520                                                                  ;PASSED PARAM. WAS A BYTE, NOT A WORD!)
2521
2522  004732  000205                          RTS     R5              ;NOW, RETURN
2523
2524
```

```
                            .SBTTL ....INITT2 -- INITIALIZE TIMER #2
                            ;*************************************************************************
                            ;* INITT2 - INITIALIZE TIMER # 2
                            ;*
                            ;*       CALLING SEQUENCE:
                            ;*
                            ;*            JSR     R5,INITT2
                            ;*            .WORD   <VALUE LOADED INTO "T2L-L" & "T2C-H">
                            ;*            .BYTE   <BIT 5 WILL BE LOADED INTO "ACR", BIT 4 WILL BE USED
                            ;*                    TO SET OR CLEAR BIT 5 ("T2") OF THE INTERRUPT ENABLE
                            ;*                    REGISTER ("IER")>
                            ;*            .BYTE   <UNUSED>
                            ;*
                            ;*
                            ;* NOTE:
                            ;*
                            ;* FIRST T2L-L IS LOADED, THEN T2C-H.  THIS SECOND LOAD WILL RESET THE TIMEOUT
                            ;* BIT AND COUNTER LOGIC.  IT IS EXPECTED AT THIS TIME (5/25/79) THAT THE
                            ;* INTERRUPT FACILITY OF THE VIA CHIP WILL NOT BE USED -- HOWEVER, ACCESS TO
                            ;* THE INTERRUPT ENABLE BIT IS GIVEN THROUGH THE SECOND PARAMETER IN THE
                            ;* CALLING SEQUENCE (BIT 4 = 0 WILL CAUSE THIS ROUTINE TO CLEAR THE ENABLE BIT
                            ;* ("T2") IN "IER".)
                            ;*
                            ;*************************************************************************

004734  010146              INITT2: MOV     R1,-(SP)        ;SAVE THE REGISTER WE WILL BE USING
004736  012537  005056            MOV     (R5)+,10$       ;SETUP VALUE TO BE WRITTEN IN COUNTER
004742  111501                    MOVB    (R5),R1         ;GET & PROCESS BIT FOR ACR 5
004744  143701  000337            BICB    337,R1
004750  010137  005046            MOV     R1,4$           ;SETUP CALL TO SET OR CLEAR ACR'S BIT 5
004754  112501                    MOVB    (R5)+,R1        ;NOW, GET THE BIT TO BE USED IN SETTING OR
                                                        ;CLEARING BIT 5 OF "IER"
004756  106301                    ASLB    R1              ;THE PASSED BIT IS IN THE WRONG POSITION
004760  106301                    ASLB    R1              ;BUT, THE PASSED BIT SHOULD CONTROL THE
004762  106301                    ASLB    R1              ;OPERATION.
                                                        ;WE KNOW WE ARE SETTING OR CLEARING BIT 5 --
                                                        ;THUS, THE PASSED BIT WILL BECOME THE CONTROLLING
                                                        ;BIT 7 AND WE WILL "OR" IN THE BIT WE WISH TO
                                                        ;BE CONTROLLED (BIT 5).
004764  143701  000177            BICB    177,R1          ;FIRST, MAKE SURE ALL UNWANTED BITS ARE CLEARED
004770  153701  000040            BISB    040,R1          ;THEN SET BIT 5
004774  010137  005006            MOV     R1,2$           ;THE CALL WILL NOW WRITE THE APPROPRIATE VALUE

005000  004537  003712            JSR     R5,WRITEI       ;WRITE TO
005004  120016                    VIAIER                  ;THE VIA'S IER
005006  000000            2$:     .WORD   0               ;INTERRUPT ENABLE/DISABLE INFORMATION

005010  004537  003566            JSR     R5,READI        ;READ THE CURRENT SETTING OF
005014  120013                    VIAACR                  ;THE VIA'S ACR
005016  000000            3$:     .WORD   0               ;INTO "3$"

005020  013701  005016            MOV     3$,R1           ;GET THAT VALUE
005024  143701  000040            BICB    040,R1          ;CLEAR THE CURRENT SETTING OF BIT 5
005030  053701  005046            BIS     4$,R1           ;SET IT ACCORDING TO THE PASSED VALUE
005034  010137  005046            MOV     R1,4$           ;PASS NEW REG. SETTING TO APPROPRIATE CALL
```

....INITT2 -- INITIALIZE TIMER #2

```
2581  005040  004537  003712                JSR     R5,WRITEI       ;WRITE TO
2582  005044  120013                       VIAACR                  ;THE VIA'S ACR
2583  005046  000000              4$:      .WORD   0               ;THE NEW REGISTER SETTING
2584
2585  005050  004537  003712                JSR     R5,WRITEI       ;WRITE TO
2586  005054  120010                       VIAT2A                  ;LOW ORDER LATCH & COUNTER (T2L-L & T2C-L)
2587  005056  000000              10$:     .WORD   0               ;THE VALUE PASSED
2588
2589  005060  113737  005057  005074        MOVB    10$+1,11$       ;SETUP FOR AND
2590  005066  004537  003712                JSR     R5,WRITEI       ;WRITE TO
2591  005072  120011                       VIAT2B                  ;HIGH ORDER COUNTER (T2C-H) <ALSO STARTS CTR>
2592  005074  000000              11$:     .WORD   0               ;THE VALUE PASSED
2593
2594                                ; DON'T WAIT AROUND FOR ANYTHING TO HAPPEN -- JUST (JEST) RETURN!
2595
2596  005076  012601                        MOV     (SP)+,R1        ;BUT FIRST RESTORE R1
2597  005100  005205                        INC     R5              ;AND PUT R5 BACK ON A WORD BOUNDRY (THE LAST
2598                                                                ;PASSED PARAM. WAS A BYTE, NOT A WORD!)
2599
2600  005102  000205                        RTS     R5              ;THEN RETURN
2601
```

```
                        .SBTTL ....RSTCHK -- RESET USYRT/VERIFY ALL USYRT REGS @ RESET STATE
                        ;*************************************************************************
                        ; RSTCHK - MANUALLY RESET THE USYRT AND VERIFY THAT ALL USYRT REGISTERS
                        ;         ARE IN THEIR RESET STATE. AN ERROR MESSAGE IDENTIFYING THE
                        ;         FAILING REGISTER IS STACKED IF ONE IS ENCOUNTERED.
                        ;
                        ;       CALLING SEQUENCE:
                        ;               JSR     R5,RSTCHK
                        ;*************************************************************************

005104                  RSTCHK:
005104  010146                MOV     R1,-(SP)        ;SAVE R1
005106  010246                MOV     R2,-(SP)        ;SAVE R2

005110  004537  003712          JSR     R5,WRITEI       ;SET PROGRAM RESET BIT IN VIA ORB REG
005114  120000                  VIAORB
005116  000031                  DTR!RTSND!PRESET
005120  004537  003712          JSR     R5,WRITEI       ;CLEAR PROGRAM RESET BIT IN VIA ORB REG
005124  120000                  VIAORB
005126  000030                  DTR!RTSND

005130  005001                  CLR     R1              ;INIT USYRT REG ADRS PTR
005132  012702  002606          MOV     @PATF,R2        ;INIT DATA PATTERN POINTER
005136  016137  002476  005150  6$:     MOV     USYREG(R1),7$   ;SET USYRT READ ADDRESS
005144  004537  003566          JSR     R5,READI        ;READ A USYRT REG
005150  000000                  7$:     .WORD   0       ;USYRT REG ADRS GOES HERE
005152  000000                  8$:     .WORD   0       ;DATA READ IS RETURNED HERE
005154  123722  005152          CMPB    8$,(R2)+        ;SEE IF REG CONTAINS EXPECTED DATA
005160  001432                  BEQ     9$              ;BR IF MATCH

005162  010137  002336          MOV     R1,REGNUM       ;SET USYRT REG NO. FOR PRINTOUT
005166  006237  002336          ASR     REGNUM          ;GET WORD OFFSET
005172  005037  002324          CLR     GDATA           ;GET EXPECTED DATA
005176  116237  177777  002324  MOVB    -1(R2),GDATA
005204  013737  005152  002326  MOV     8$,BDATA        ;GET ACTUAL DATA
                        ;STACK "USYRT NOT CLEANED BY PROGRAM RESET" MSG
005212                  GTDF    EM2,ERR10
                                ;       QUEUE "DEVICE FATAL" ERROR # 6
005212  012737  000001  002172                          MOV     #T.EDF,ERRTYP
005220  012737  000006  002174                          MOV     #6,ERRNBR
005226  012737  014214  002176                          MOV     #EM2,ERRMSG
005234  012737  020364  002200                          MOV     #ERR10,ERRBLK
005242  000261                  SEC                     ;SET C BIT TO FLAG ERROR
005244  000406                  BR      10$             ;TAKE ERROR EXIT

005246  062701  000002  9$:     ADD     #2,R1           ;INCR USYRT REG ADRS PTR
005252  020127  000020          CMP     R1,#16.         ;SEE IF ALL REGS READ YET
005256  002727                  BLT     6$              ;BR IF NOT
005260  000241                  CLC                     ;** CLEAR C BIT FOR NO ERRORS
005262  012602          10$:    MOV     (SP)+,R2        ;RESTORE R2
005264  012601                  MOV     (SP)+,R1        ;RESTORE R1
005266  000205                  RTS     R5              ;** RETURN
```

```
                                ;*************************************************************************
                                ;* WAIT50 - THIS SUBROUTINE STALLS FOR AT LEAST 50 MICRO-SEC, AND THEN RETURNS.
                                ;*************************************************************************
005270  010146                  WAIT50: MOV     R1,-(SP)        ;SAVE R1
005272  012701  000764                  MOV     #500.,R1        ;INIT COUNTER
005276  077101                  3$:     SOB     R1,3$           ;DELAY HERE FOR 23.8 MICRO-SEC'S
005300  012601                          MOV     (SP)+,R1        ;RESTORE R1
005302  000207                          RTS     PC              ;RETURN

                                ;       OVERHEAD (JSR, MOV, MOV, MOV, & RTS) ADD UP TO 25.25 MICRO-SEC'S

                                ;       THEREFORE, ACTUAL TOTAL DELAY IS 49.35 MICRO-SECONDS



                                .SBTTL ....SETVIA -- SET UP VIA REGISTERS
                                ;*************************************************************************
                                ;* SETVIA - SET UP THE VIA REGISTERS
                                ;*
                                ;*      THIS SUBROUTINE PROGRAMS THE VIA REGISTERS FOR NORMAL OPERATION, BY
                                ;*      LOADING THE DDRB, DDRA, ORB, ACR, PCR, IER.
                                ;*
                                ;*      CALLING SEQUENCE :
                                ;*         JSR  PC,SETVIA
                                ;*************************************************************************
005304                          SETVIA:
005304  004537  003712                  JSR     R5,WRITEI       ;SET PORT B FOR OUTPUT MODE
005310  120002                          VIADPB
005312  000377                          377
005314  004537  003712                  JSR     R5,WRITEI       ;SET PORT A FOR INPUT MODE
005320  120003                          VIADPA                  ; (BIT0 IS ONLY OUTPUT BIT)
005322  000001                          001
005324  004537  003712                  JSR     R5,WRITEI       ;DISABLE USYRT INTERNAL LOOPBACK
005330  120017                          VIAORA
005332  000000                          000
005334  004537  003712                  JSR     R5,WRITEI       ;INIT PORT B
005340  120000                          VIAORB
005342  000030                          DTR!RTSND
005344  004537  003712                  JSR     R5,WRITEI       ;SET ACR FOR :  T1 SQUARE WAVE OUTPUT MODE.
005350  120013                          VIAACR                  ;               T2 ONE-SHOT OUTPUT MODE.
005352  000350                          350                     ;               SR AT SYS CLOCK RATE ON CB1
005354  004537  003712                  JSR     R5,WRITEI       ;SET PCR FOR :  CB1 NEG TRANS INPUT MODE.
005360  120014                          VIAPCR                  ;               CA2 NEG TRANS INPUT MODE.
005362  000022                          022                     ;               CA1 NEG TRANS INPUT MODE
005364  004537  003712                  JSR     R5,WRITEI       ;DISABLE ALL MICRO-INTRPTS
005370  120016                          VIAIER
005372  000177                          177
005374  000207                          RTS     PC              ;RETURN
```

```
                                .SBTTL ....INIDMV -- INIT DMV (MCLR, VIA SETUP)
                                ;*****************************************************************************
                                ;* INIDMV - THIS SUBROUTINE INITIALIZES THE DMV-11, BY DOING A MASTER CLEAR,
                                ;*      ENTERING THE M-LOOP, AND PROGRAMMING THE VIA REGS FOR DEFAULT
                                ;*      OPERATION.
                                ;*
                                ;*      CALLING SEQUENCE :
                                ;*          JSR  PC,INIDMV
                                ;*****************************************************************************
005376  004737  003352          INIDMV: JSR     PC,MSTCLR       ;MASTER CLR, M-LOOP
005402  004737  005304                  JSR     PC,SETVIA       ;PROGRAM VIA
005406  000207                          RTS     PC              ;RETURN


                                .SBTTL ....CKUSTS -- CHECK USYRT STATUS REGISTERS
                                ;*****************************************************************************
                                ;* CKUSTS - THIS SUBROUTINE CHECKS THE USYRT STATUS BY READING THE USYRT
                                ;*      STATUS REGISTER AND COMPARING IT TO THE LOW BYTE OF THE WORD FOLLOWING
                                ;*      THE CALL. IF THERE IS A MISMATCH, THE SUBROUTINE STACKS THE ERROR
                                ;*      INFORMATION, AND SETS THE "C" BIT AND RETURNS.
                                ;*****************************************************************************
005410                          CKUSTS:
005410  004537  003566                  JSR     R5,READI        ;READ USYRT STATUS REGISTER
005414  122000                          USTATR
005416  000000                  1$:     .WORD   0
005420  122537  005416                  CMPB    (R5)+,1$        ;SEE IF STATUS MATCHES EXPECTED
005424  000241                          CLC                     ;CLEAR C BIT
005426  001430                          BEQ     2$              ;BR IF STATUS OK
005430  012737  000007  002336          MOV     #7,REGNUM       ;SET USYRT REG NO. FOR PRINTOUT
005436  016537  177777  002324          MOV     -1(R5),GDATA    ;GET EXPECTED DATA
005444  005037  002326                  CLR     BDATA           ;GET ACTUAL DATA
005450  113737  005416  002326          MOVB    1$,BDATA
                                ;STACK "USYRT STATUS INCORRECT" ERROR
005456                                  GTDF    EM68,ERR10
                                ;               QUEUE "DEVICE FATAL" ERROR # 7
005456  012737  000001  002172                                          MOV     #T.EDF,ERRTYP
005464  012737  000007  002174                                          MOV     #7,ERRNBR
005472  012737  014650  002176                                          MOV     #EM68,ERRMSG
005500  012737  020364  002200                                          MOV     #ERR10,ERRBLK
005506  000261                          SEC                     ;SET C BIT FOR ERROR
005510  005205                  2$:     INC     R5              ;INCREMENT R5 PAST ARGUMENT
005512  000205                          RTS     R5              ;RETURN
```

```
                                        ....CKTACT -- CHECK TRANSMITTER ACTIVE (TXACT)

                                .SBTTL ....CKTACT -- CHECK TRANSMITTER ACTIVE (TXACT)
                                ;**********************************************************************
                                ;* CKTACT - THIS SUBROUTINE CHECKS FOR THE PROPER STATE OF TXACT IN THE USYRT
                                ;*      STATUS REGISTER, AND REPORTS AN ERROR IF IT IS NOT PROPERLY SET TO THE
                                ;*      STATE OF BIT 0 IN THE WORD FOLLOWING THE CALL.
                                ;*
                                ;*      CALLING SEQUENCE :
                                ;*      JSR     R5,CKTACT
                                ;*      .WORD   <BIT 0 IS EXPECTED VALUE OF TXACT>
                                ;**********************************************************************
005514                          CKTACT:
005514  012737  000007  002336          MOV     #7,REGNUM       ;SET REG NO. FOR POSSIBLE ERROR REPORT
005522  004537  005566                  JSR     R5,READI        ;READ USYRT STATUS
005526  122000                          USTATR
005530  000000                  1$:     .WORD   0
005532  032725  000001                  BIT     #BIT0,(R5)+     ;GET EXPECTED STATE OF TXACT
005536  001422                          BEQ     2$              ;BR IF EXPECTED TXACT = 0
005540  132737  000004  005530          BITB    #TXACT,1$       ;SEE IF TXACT = 1
005546  001040                          BNE     3$              ;BR IF TXACT = 1
                                ;STACK "TXACT NOT SET" MSG
005550                                  GTDF    EM69,ERR12
                                ;       QUEUE "DEVICE FATAL" ERROR # 8
005550  012737  000001  002172                                          MOV     #T.EDF,ERRTYP
005556  012737  000010  002174                                          MOV     #8,ERR@R
005564  012737  014677  002176                                          MOV     #EM69,ERRMSG
005572  012737  020714  002200                                          MOV     #ERR12,ERRBLK
005600  000261                          SEC                     ;SET C BIT TO FLAG ERROR
005602  000423                          BR      4$              ;TAKE ERROR EXIT
005604  132737  000004  005530  2$:     BITB    #TXACT,1$       ;SEE IF TXACT = 0
005612  001416                          BEQ     3$              ;BR IF TXACT = 0
                                ;STACK "TXACT NOT CLEARED" MSG
005614                                  GTDF    EM70,ERR12
                                ;       QUEUE "DEVICE FATAL" ERROR # 9
005614  012737  000001  002172                                          MOV     #T.EDF,ERRTYP
005622  012737  000011  002174                                          MOV     #9,ERR@R
005630  012737  014715  002176                                          MOV     #EM70,ERRMSG
005636  012737  020714  002200                                          MOV     #ERR12,ERRBLK
005644  000261                          SEC                     ;SET C BIT TO FLAG ERROR
005646  000401                          BR      4$              ;TAKE ERROR EXIT
005650  000241                  3$:     CLC                     ;CLEAR C BIT FOR NO ERRORS
005652  000205                  4$:     RTS     R5              ;RETURN
```

```
                        .SBTTL ....CKRACT -- CHECK RECEIVER ACTIVE (RXACT)
                        ;**********************************************************************
                        ;* CKRACT - THIS SUBROUTINE CHECKS FOR THE PROPER STATE OF RXACT IN THE USYRT
                        ;*      STATUS REGISTER, AND REPORTS AN ERROR IF IT IS NOT PROPERLY SET TO THE
                        ;*      STATE OF BIT 0 IN THE WORD FOLLOWING THE CALL.
                        ;*
                        ;*      CALLING SEQUENCE :
                        ;*      JSR     R5,CKRACT
                        ;*      .WORD   <BIT 0 IS EXPECTED VALUE OF RXACT>
                        ;**********************************************************************
005654                  CKRACT:
005654  012737  000007  002336          MOV     #7,REGNUM       ;SET REG NO. FOR POSSIBLE ERROR REPORT
005662  004537  003566                  JSR     R5,READI        ;READ USYRT STATUS
005666  122000                          USTATR
005670  000000          1$:     .WORD   0
005672  032725  000001                  BIT     #BIT0,(R5)+     ;GET EXPECTED STATE OF RXACT
005676  001422                          BEQ     2$              ;BR IF EXPECTED RXACT = 0
005700  132737  000040  005670          BITB    #RXACT,1$       ;SEE IF RXACT = 1
005706  001040                          BNE     3$              ;BR IF RXACT = 1
                        ;STACK "RXACT NOT SET" MSG
005710                                  GTDF    EM71,ERR12
                                                ;       QUEUE "DEVICE FATAL" ERROR # 10
005710  012737  000001  002172                                          MOV     #T.EDF,ERRTYP
005716  012737  000012  002174                                          MOV     #10,ERRNBR
005724  012737  014737  002176                                          MOV     #EM71,ERRMSG
005732  012737  020714  002200                                          MOV     #ERR12,ERRBLK
005740  000261                          SEC                     ;SET C BIT TO FLAG ERROR
005742  000423                          BR      4$              ;TAKE ERROR EXIT
005744  132737  000040  005670  2$:     BITB    #RXACT,1$       ;SEE IF RXACT = 0
005752  001416                          BEQ     3$              ;BR IF RXACT = 0
                        ;STACK "RXACT NOT CLEARED" MSG
005754                                  GTDF    EM72,ERR12
                                                ;       QUEUE "DEVICE FATAL" ERROR # 11
005754  012737  000001  002172                                          MOV     #T.EDF,ERRTYP
005762  012737  000013  002174                                          MOV     #11,ERRNBR
005770  012737  014755  002176                                          MOV     #EM72,ERRMSG
005776  012737  020714  002200                                          MOV     #ERR12,ERRBLK
006004  000261                          SEC                     ;SET C BIT TO FLAG ERROR
006006  000401                          BR      4$              ;TAKE ERROR EXIT
006010  000241          3$:     CLC                             ;CLEAR C BIT FOR NO ERRORS
006012  000205          4$:     RTS     R5                      ;RETURN
```

```
                                .SBTTL ....CKTBMT -- CHECK TRANSMIT BUFFER EMPTY
                                ;**********************************************************************
                                ;* CKTBMT - THIS SUBROUTINE CHECKS FOR THE PROPER STATE OF TBMT IN THE USYRT
                                ;*      STATUS REGISTER, AND REPORTS AN ERROR IF IT IS NOT PROPERLY SET TO THE
                                ;*      STATE OF BIT 0 IN THE WORD FOLLOWING THE CALL.
                                ;*
                                ;*      CALLING SEQUENCE :
                                ;*      JSR     R5,CKTBMT
                                ;*      .WORD   <BIT 0 IS EXPECTED VALUE OF TBMT>
                                ;**********************************************************************
006014                          CKTBMT:
006014  012737  000007  002336          MOV     #7,REGNUM       ;SET REG NO. FOR POSSIBLE ERROR REPORT
006022  004537  003566                  JSR     R5,READI        ;READ USYRT STATUS
006026  122000                          USTATR
006030  000000                  1$:     .WORD   0
006032  032725  000001                  BIT     #BIT0,(R5)+     ;GET EXPECTED STATE OF TBMT
006036  001422                          BEQ     2$              ;BR IF EXPECTED TBMT = 0
006040  132737  000100  006030          BITB    #TBMT,1$        ;SEE IF TBMT = 1
006046  001040                          BNE     3$              ;BR IF TBMT = 1
                                ;STACK "TBMT NOT SET" MSG
006050                                  GTDF    EM73,ERR12
                                                        ;       QUEUE "DEVICE FATAL" ERROR # 12
006050  012737  000001  002172                                          MOV     #T.EDF,ERRTYP
006056  012737  000014  002174                                          MOV     #12,ERRNBR
006064  012737  014777  002176                                          MOV     #EM73,ERRMSG
006072  012737  020714  002200                                          MOV     #ERR12,ERRBLK
006100  000261                          SEC                     ;SET C BIT TO FLAG ERROR
006102  000423                          BR      4$              ;TAKE ERROR EXIT
006104  132737  000100  006030  2$:     BITB    #TBMT,1$        ;SEE IF TBMT = 0
006112  001416                          BEQ     3$              ;BR IF TBMT = 0
                                ;STACK "TBMT NOT CLEARED" MSG
006114                                  GTDF    EM74,ERR12
                                                        ;       QUEUE "DEVICE FATAL" ERROR # 13
006114  012737  000001  002172                                          MOV     #T.EDF,ERRTYP
006122  012737  000015  002174                                          MOV     #13,ERRNBR
006130  012737  015014  002176                                          MOV     #EM74,ERRMSG
006136  012737  020714  002200                                          MOV     #ERR12,ERRBLK
006144  000261                          SEC                     ;SET C BIT TO FLAG ERROR
006146  000401                          BR      4$              ;TAKE ERROR EXIT
006150  000241                  3$:     CLC                     ;CLEAR C BIT FOR NO ERRORS
006152  000205                  4$:     RTS     R5              ;RETURN
```

```
                                .SBTTL ....CKRDA -- CHECK RECEIVE DATA AVAILABLE
                                ;**************************************************************************
                                ;* CKRDA - THIS SUBROUTINE CHECKS FOR THE PROPER STATE OF RDA IN THE USYRT
                                ;*      STATUS REGISTER, AND REPORTS AN ERROR IF IT IS NOT PROPERLY SET TO THE
                                ;*      STATE OF BIT 0 IN THE WORD FOLLOWING THE CALL.
                                ;*
                                ;*      CALLING SEQUENCE :
                                ;*      JSR     R5,CKRDA
                                ;*      .WORD   <BIT 0 IS EXPECTED VALUE OF RDA>
                                ;**************************************************************************
006154                          CKRDA:
006154  012737  000007  002336          MOV     #7,REGNUM       ;SET REG NO. FOR POSSIBLE ERROR REPORT
006162  004537  003566                  JSR     R5,READI        ;READ USYRT STATUS
006166  122000                          USTATR
006170  000000                  1$:     .WORD   0
006172  032725  000001                  BIT     #BIT0,(R5)+     ;GET EXPECTED STATE OF RDA
006176  001422                          BEQ     2$              ;BR IF EXPECTED RDA = 0
006200  132737  000200  006170          BITB    #RDA,1$         ;SEE IF RDA = 1
006206  001040                          BNE     3$              ;BR IF RDA = 1
                                ;STACK "RDA NOT SET" MSG
006210                                  GTDF    EM75,ERR12
                                ;       QUEUE "DEVICE FATAL" ERROR # 14
006210  012737  000001  002172                                          MOV     #T.EDF,ERRTYP
006216  012737  000014  002174                                          MOV     #14,ERRNBR
006224  012737  015035  002176                                          MOV     #EM75,ERRMSG
006232  012737  020714  002200                                          MOV     #ERR12,ERRBLK
006240  000261                          SEC                     ;SET C BIT TO FLAG ERROR
006242  000423                          BR      4$              ;TAKE ERROR EXIT
006244  132737  000200  006170  2$:     BITB    #RDA,1$         ;SEE IF RDA = 0
006252  001416                          BEQ     3$              ;BR IF RDA = 0
                                ;STACK "RDA NOT CLEARED" MSG
006254                                  GTDF    EM76,ERR12
                                ;       QUEUE "DEVICE FATAL" ERROR # 15
006254  012737  000001  002172                                          MOV     #T.EDF,ERRTYP
006262  012737  000017  002174                                          MOV     #15,ERRNBR
006270  012737  015051  002176                                          MOV     #EM76,ERRMSG
006276  012737  020714  002200                                          MOV     #ERR12,ERRBLK
006304  000261                          SEC                     ;SET C BIT TO FLAG ERROR
006306  000401                          BR      4$              ;TAKE ERROR EXIT
006310  000241                  3$:     CLC                     ;CLEAR C BIT FOR NO ERRORS
006312  000205                  4$:     RTS     R5              ;RETURN
```

```
                                .SBTTL ....CKRSA -- CHECK RECEIVER STATUS AVAILABLE
                                ;*****************************************************************************
                                ;* CKRSA - THIS SUBROUTINE CHECKS FOR THE PROPER STATE OF RSA IN THE USYRT
                                ;*      STATUS REGISTER, AND REPORTS AN ERROR IF IT IS NOT PROPERLY SET TO THE
                                ;*      STATE OF BIT 0 IN THE WORD FOLLOWING THE CALL.
                                ;*
                                ;*      CALLING SEQUENCE :
                                ;*      JSR     R5,CKRSA
                                ;*      .WORD   <BIT 0 IS EXPECTED VALUE OF RSA>
                                ;*****************************************************************************
006314                          CKRSA:
006314  012737  000007  002336        MOV     #7,REGNUM       ;SET REG NO. FOR POSSIBLE ERROR REPORT
006322  004537  003566                JSR     R5,READI        ;READ USYRT STATUS
006326  122000                       USTATR
006330  000000                1$:     .WORD   0
006332  032725  000001                BIT     #BIT0,(R5)+     ;GET EXPECTED STATE OF RSA
006336  001422                        BEQ     2$              ;BR IF EXPECTED RSA = 0
006340  132737  000020  006330        BITB    #RSA,1$         ;SEE IF RSA = 1
006346  001040                        BNE     3$              ;BR IF RSA = 1
                                ;STACK "RSA NOT SET" MSG
006350                                  GTDF    EM77,ERR12
                                ;       QUEUE "DEVICE FATAL" ERROR # 16
006350  012737  000001  002172                                  MOV     #T.EDF,ERRTYP
006356  012737  000020  002174                                  MOV     #16,ERRNBR
006364  012737  015071  002176                                  MOV     #EM77,ERRMSG
006372  012737  020714  002200                                  MOV     #ERR12,ERRBLK
006400  000261                        SEC                     ;SET C BIT TO FLAG ERROR
006402  000423                        BR      4$              ;TAKE ERROR EXIT
006404  132737  000020  006330  2$:   BITB    #RSA,1$         ;SEE IF RSA = 0
006412  001416                        BEQ     3$              ;BR IF RSA = 0
                                ;STACK "RSA NOT CLEARED" MSG
006414                                  GTDF    EM78,ERR12
                                ;       QUEUE "DEVICE FATAL" ERROR # 17
006414  012737  000001  002172                                  MOV     #T.EDF,ERRTYP
006422  012737  000021  002174                                  MOV     #17,ERRNBR
006430  012737  015105  002176                                  MOV     #EM78,ERRMSG
006436  012737  020714  002200                                  MOV     #ERR12,ERRBLK
006444  000261                        SEC                     ;SET C BIT TO FLAG ERROR
006446  000401                        BR      4$              ;TAKE ERROR EXIT
006450  000241                  3$:   CLC                     ;CLEAR C BIT FOR NO ERRORS
006452  000205                  4$:   RTS     R5              ;RETURN
```

```
                                .SBTTL ....CKROR -- CHECK RECEIVER OVERRUN
                                ;**********************************************************************
                                ;* CKROR - THIS SUBROUTINE CHECKS FOR THE OCCURANCE OF RECEIVER OVERRUN IN THE
                                ;*       USYRT RECEIVER STATUS REGISTER (RDSRH), AND REPORTS AN ERROR IF IT IS
                                ;*        NOT PROPERLY SET TO THE STATE OF BIT 0 IN THE WORD FOLLOWING THE CALL.
                                ;*
                                ;*       CALLING SEQUENCE :
                                ;*       JSR     R5,CKROR
                                ;*       .WORD   <BIT 0 IS EXPECTED VALUE OF ROR>
                                ;**********************************************************************
006454                          CKROR:
006454  012737  000001  002336          MOV     #1,REGNUM       ;SET REG NO. FOR POSSIBLE ERROR REPORT
006462  004537  003566                  JSR     R5,READI        ;READ RECEIVER STATUS
006466  120401                          RDSRH
006470  000000                  1$:     .WORD   0
006472  032725  000001                  BIT     #BIT0,(R5)+     ;GET EXPECTED STATE OF ROR
006476  001422                          BEQ     2$              ;BR IF EXPECTED ROR = 0
006500  132737  000010  006470          BITB    #ROR,1$         ;SEE IF ROR = 1
006506  001040                          BNE     3$              ;BR IF ROR = 1
                                ;STACK "RECEIVER OVRN NOT SET" MSG
006510                                  GTDF    EM90,ERR12
                                                        ;       QUEUE "DEVICE FATAL" ERROR # 18
006510  012737  000001  002172                                                  MOV     #T.EDF,ERRTYP
006516  012737  000022  002174                                                  MOV     #18,ERRNBR
006524  012737  015450  002176                                                  MOV     #EM90,ERRMSG
006532  012737  020714  002200                                                  MOV     #ERR12,ERRBLK
006540  000261                          SEC                     ;SET C BIT TO FLAG ERROR
006542  000423                          BR      4$              ;TAKE ERROR EXIT
006544  132737  000010  006470  2$:     BITB    #ROR,1$         ;SEE IF ROR = 0
006552  001416                          BEQ     3$              ;BR IF ROR = 0
                                ;STACK "ROR NOT CLEARED" MSG
006554                                  GTDF    EM91,ERR12
                                                        ;       QUEUE "DEVICE FATAL" ERROR # 19
006554  012737  000001  002172                                                  MOV     #T.EDF,ERRTYP
006562  012737  000023  002174                                                  MOV     #19,ERRNBR
006570  012737  015501  002176                                                  MOV     #EM91,ERRMSG
006576  012737  020714  002200                                                  MOV     #ERR12,ERRBLK
006604  000261                          SEC                     ;SET C BIT TO FLAG ERROR
006606  000401                          BR      4$              ;TAKE ERROR EXIT
006610  000241                  3$:     CLC                     ;CLEAR C BIT FOR NO ERRORS
006612  000205                  4$:     RTS     R5              ;RETURN
```

```
                                .SBTTL ....CKSEOM -- CHECK RSOM, REOM
                                ;**************************************************************************
                                ;* CKSEOM - THIS SUBROUTINE CHECKS FOR THE PROPER STATES OF RSOM, REOM IN THE
                                ;*      USYRT RECEIVER STATUS REG (RDSRH) AND REPORTS AN ERROR IF THEY ARE NOT
                                ;*      PROPERLY SET TO THE STATES OF BITS 0,1 IN THE WORD FOLLOWING THE CALL.
                                ;*      IF THE SUBROUTINE DETECTS AN ERROR, THE ERROR INFORMATION
                                ;*      IS STACKED, AND THE C-BIT SET, WHICH LEAVES THE ERROR REPORTING AT THE
                                ;*      DISCRETION OF THE CALLING ROUTINE OR SUBROUTINE.
                                ;*
                                ;*      CALLING SEQUENCE :
                                ;*         JSR  R5,CKSEOM
                                ;*         <BIT 0 IS EXPECTED VALUE OF RSOM, BIT 1 IS VALUE OF REOM>
                                ;**************************************************************************
006614                          CKSEOM:
006614  012737  000007  002336          MOV     #7,REGNUM       ;SET REG NO. FOR POSSIBLE ERROR REPORT
006622  004537  003566                  JSR     R5,READI        ;READ USYRT RECEIVER STATUS
006626  120401                          RDSRH
006630  000000                  1$:     .WORD   0
006632  032725  000001                  BIT     #BIT0,(R5)+     ;GET EXPECTED STATE OF RSOM
006636  001422                          BEQ     2$              ;BR IF EXPECTED RSOM = 0
006640  132737  000001  006630          BITB    #RSOM,1$        ;SEE IF RSOM = 1
006646  001040                          BNE     3$              ;BR IF RSOM = 1
                                ;STACK "RSOM NOT SET" MSG
006650                                  GTDF    EM29,ERR12
                                ;       QUEUE "DEVICE FATAL" ERROR # 20
006650  012737  000001  002172                                  MOV     #T.EDF,ERRTYP
006656  012737  000024  002174                                  MOV     #20,ERRNBR
006664  012737  014427  002176                                  MOV     #EM29,ERRMSG
006672  012737  020714  002200                                  MOV     #ERR12,ERRBLK
006700  000261                          SEC                     ;SET C BIT TO FLAG ERROR
006702  000473                          BR      6$              ;TAKE ERROR EXIT
006704  132737  000001  006630  2$:     BITB    #RSOM,1$        ;SEE IF RSOM = 0
006712  001416                          BEQ     3$              ;BR IF RSOM = 0
                                ;STACK "RSOM NOT CLEARED" MSG
006714                                  GTDF    EM28,ERR12
                                ;       QUEUE "DEVICE FATAL" ERROR # 21
006714  012737  000001  002172                                  MOV     #T.EDF,ERRTYP
006722  012737  000025  002174                                  MOV     #21,ERRNBR
006730  012737  014406  002176                                  MOV     #EM28,ERRMSG
006736  012737  020714  002200                                  MOV     #ERR12,ERRBLK
006744  000261                          SEC                     ;SET C BIT TO FLAG ERROR
006746  000451                          BR      6$              ;TAKE ERROR EXIT
006750  032765  000002  177776  3$:     BIT     #BIT1,-2(R5)    ;GET EXPECTED STATE OF REOM
006756  001422                          BEQ     4$              ;BR IF EXPECTED REOM = 0
006760  132737  000002  006630          BITB    #REOM,1$        ;SEE IF REOM = 1
006766  001040                          BNE     5$              ;BR IF REOM = 1
                                ;STACK "REOM NOT SET" MSG
006770                                  GTDF    EM31,ERR12
                                ;       QUEUE "DEVICE FATAL" ERROR # 22
006770  012737  000001  002172                                  MOV     #T.EDF,ERRTYP
006776  012737  000026  002174                                  MOV     #22,ERRNBR
007004  012737  014465  002176                                  MOV     #EM31,ERRMSG
007012  012737  020714  002200                                  MOV     #ERR12,ERRBLK
007020  000261                          SEC                     ;SET C BIT TO FLAG ERROR
007022  000423                          BR      6$              ;TAKE ERROR EXIT
007024  132737  000002  006630  4$:     BITB    #REOM,1$        ;SEE IF REOM = 0
```

J6


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 3078  007032  001416                        BEQ     5$                ;BR IF REOM = 0
 3079                                  ;STACK "REOM NOT CLEARED" MSG
 3080  007034                                GTDF    EM30,ERR12
 3081                                        ;       QUEUE "DEVICE FATAL" ERROR # 23
 3082  007034  012737  000001  002172                                    MOV     #T.EDF,ERRTYP
 3083  007042  012737  000027  002174                                    MOV     #23,ERRNBR
 3084  007050  012737  014444  002176                                    MOV     #EM30,ERRMSG
 3085  007056  012737  020714  002200                                    MOV     #ERR12,ERRBLK
 3086  007064  000261                        SEC                       ;SET C BIT TO FLAG ERROR
 3087  007066  000401                        BR      6$                ;TAKE ERROR EXIT
 3088  007070  000241                  5$:   CLC                       ;CLEAR C BIT FOR NO ERRORS
 3089  007072  000205                  6$:   RTS     R5                ;RETURN
 3090
 3091
```

```
                                .SBTTL ....CHKTSO -- CHECK TRANSMIT SERIAL OUT BIT
                                ;**********************************************************************************
                                ;* CHKTSO - THIS SUBROUTINE CHECKS FOR THE PROPER STATE OF TSO IN THE USYRT
                                ;*      STATUS REGISTER, AND SETS THE "C" BIT IF IT IS NOT SET TO THE STATE
                                ;*      OF BIT 0 IN THE WORD FOLLOWING THE CALL.
                                ;*
                                ;*      CALLING SEQUENCE :
                                ;*      JSR     R5,CHKTSO
                                ;*      .WORD   <BIT 0 IS EXPECTED VALUE OF TSO>
                                ;**********************************************************************************
007074                          CHKTSO:
007074  012737  000007  002336          MOV     #7,REGNUM       ;SET REG NO. FOR POSSIBLE ERROR REPORT
007102  004537  003566                  JSR     R5,READI        ;READ USYRT STATUS
007106  122000                          USTATR
007110  000000                  1$:     .WORD   0
007112  032725  000001                  BIT     #BIT0,(R5)+     ;GET EXPECTED STATE OF TSO
007116  001422                          BEQ     2$              ;BR IF EXPECTED TSO = 0
007120  132737  000010  007110          BITB    #TSO,1$         ;SEE IF TSO = 1
007126  001040                          BNE     3$              ;BR IF TSO = 1
                                        ;*** STACK "TSO NOT SET" ERROR ***
007130                                  GTDF    EM100,ERR12
                                                        ;       QUEUE "DEVICE FATAL" ERROR # 24
007130  012737  000001  002172                                          MOV     #T.EDF,ERRTYP
007136  012737  000030  002174                                          MOV     #24,ERRNBR
007144  012737  015536  002176                                          MOV     #EM100,ERRMSG
007152  012737  020714  002200                                          MOV     #ERR12,ERRBLK
007160  000261                          SEC                     ;SET C BIT TO FLAG ERROR
007162  000423                          BR      4$              ;TAKE ERROR EXIT

007164  132737  000010  007110  2$:     BITB    #TSO,1$         ;SEE IF TSO = 0
007172  001416                          BEQ     3$              ;BR IF TSO = 0
                                        ;*** STACK "TSO NOT CLEARED" ERROR ***
007174                                  GTDF    EM101,ERR12
                                                        ;       QUEUE "DEVICE FATAL" ERROR # 25
007174  012737  000001  002172                                          MOV     #T.EDF,ERRTYP
007202  012737  000031  002174                                          MOV     #25,ERRNBR
007210  012737  015556  002176                                          MOV     #EM101,ERRMSG
007216  012737  020714  002200                                          MOV     #ERR12,ERRBLK
007224  000261                          SEC                     ;SET C BIT TO FLAG ERROR
007226  000401                          BR      4$              ;TAKE ERROR EXIT
007230  000241                  3$:     CLC                     ;CLEAR C BIT FOR NO ERRORS
007232  000205                  4$:     RTS     R5              ;RETURN
```

```
                                .SBTTL ....INITRN -- INIT TRANSMISSION OF A MESSAGE
                                ;**************************************************************************
                                ;* INITRN - THIS SUBROUTINE INITIATES TRANSMISSION OF A MESSAGE, BY LOADING
                                ;*          THE USYRT PCSARL,H AND THE PCR WITH THE DATA PASSED IN THE 2 WORDS
                                ;*          FOLLOWING THE CALL ; LOADING AND CLOCKING 1 SOM UNTIL THE FIRST
                                ;*          SYNCH OR FLAG HAS BEEN SERIALIZED IN THE USYRT. THE PROGRAM MONITORS
                                ;*          ALL THE FLAGS IN THE USYRT STATUS REGISTER THROUGHOUT THE PROCESS.
                                ;*          IF THE SUBROUTINE DETECTS AN ERROR, THE ERROR INFORMATION IS STACKED
                                ;*          AND THE C-BIT SET, WHICH LEAVES THE ERROR REPORTING AT THE DISCRETION
                                ;*          OF THE CALLING ROUTINE OR SUBROUTINE.
                                ;*
                                ;*       CALLING SEQUENCE :
                                ;*          JSR  R5,INITRN
                                ;*          .WORD     <VALUE TO LOAD INTO USYRT PCSARL,H>
                                ;*          .WORD     <VALUE TO LOAD INTO USYRT PCR (PASSED IN LO BYTE)>
                                ;*                    <SPECIAL VIAORB MASKING VALUE (PASSED IN HI BYTE)>
                                ;**************************************************************************
007234                          INITRN:
007234  010146                          MOV     R1,-(SP)        ;SAVE R1
007236  004537  003712                  JSR     R5,WRITEI       ;RESET THE USYRT
007242  120000                          VIAORB
007244  000031                          RTSND!DTR!PRESET
007246  004537  003712                  JSR     R5,WRITEI       ;CLEAR USYRT RESET BIT
007252  120000                          VIAORB
007254  000030                          RTSND!DTR
007256  112537  007270                  MOVB    (R5)+,1$        ;GET VALUE TO LOAD INTO USYRT PCSARL
007262  004537  003712                  JSR     R5,WRITEI       ;LOAD USYRT PCSARL
007266  120404                          PCSARL
007270  000000                  1$:     .WORD   0
007272  112537  007304                  MOVB    (R5)+,2$        ;GET VALUE TO LOAD INTO PCSARH
007276  004537  003712                  JSR     R5,WRITEI       ;LOAD USYRT PCSARH
007302  120405                          PCSARH
007304  000000                  2$:     .WORD   0
007306  112537  007332                  MOVB    (R5)+,3$        ;GET VALUE TO LOAD INTO PCR
007312  005037  002402                  CLR     SAVLEN
007316  113737  007332  002402          MOVB    3$,SAVLEN       ;SAVE CHAR LENGTH BITS
007324  004537  003712                  JSR     R5,WRITEI       ;LOAD USYRT PCR
007330  120407                          PCR
007332  000000                  3$:     .WORD   0
007334  004537  003712                  JSR     R5,WRITEI       ;SET ACR FOR T1 ONE-SHOT MODE
007340  120013                          VIAACR
007342  000200                          200
007344  004537  003712                  JSR     R5,WRITEI       ;LOAD VIA T1L-L
007350  120006                          VIAT1C
007352  000300                          300
007354  004537  003712                  JSR     R5,WRITEI       ;LOAD VIA T1L-H
007360  120007                          VIAT1D
007362  000000                          000
007364  004537  005410                  JSR     R5,CKUSTS       ;CHK USYRT STATUS FOR INIT'D STATE
007370  000110                          110                     ; TBMT = 1, TSO = 1
007372  103454                          BCS     7$              ;IF ERROR, EXIT SUBROUTINE
                                
007374  013737  007530  007414          MOV     20$,13$         ;* SET UP DEFAULT VIAORB PARAMETERS
007402  142537  007414                  BICB    (R5)+,13$       ;* CLEAR ANY SPECIFIED VIAORB BITS.
                                
007406  004537  003712                  JSR     R5,WRITEI       ;SET UP USYRT
```

```
3191  007412  120000                        VIAORB
3192  007414  000142              13$:      TXEN!RXEN!TTLOOP        ;* THIS VALUE MIGHT BE MODIFIED ABOVE
3193
3194  007416  004537  003712              JSR     R5,WRITEI         ;SET TSOM IN USYRT
3195  007422  120403                      TDSRH
3196  007424  000001                      TSOM
3197  007426  004537  003712              JSR     R5,WRITEI         ;LOAD SYNCH CHAR INTO TX BUF
3198  007432  120402                      TDSRL
3199  007434  000226                      SYNCH
3200  007436  004537  006014              JSR     R5,CKTBMT         ;CHK FOR TBMT = 0
3201  007442  000000                      0
3202  007444  103427                      BCS     7$                ;IF ERROR, EXIT SUBROUTINE
3203  007446  005001                      CLR     R1                ;INIT CYCLE COUNTER
3204  007450  004537  012072        4$:   JSR     R5,STEPLU         ;CLOCK LU FOR 1 CYCLE
3205  007454  000001                      1
3206  007456  004537  003566              JSR     R5,READI          ;READ USYRT STATUS REG
3207  007462  122000                      USTATR
3208  007464  000000              5$:     .WORD   0
3209  007466  132737  000100  007464      BITB    #TBMT,5$          ;SEE IF TBMT IS SET YET
3210  007474  001010                      BNE     6$                ;BR IF YES
3211  007476  005201                      INC     R1                ;INCR CYCLE COUNTER
3212  007500  020127  000003              CMP     R1,#3             ;SEE IF 3 CYCLES DONE YET
3213  007504  002761                      BLT     4$                ;BR IF LESS THAN 3 CYCLES
3214  007506  004537  006014              JSR     R5,CKTBMT         ;GO STACK "TBMT NOT SET" MSG
3215  007512  000001                      1
3216  007514  103403                      BCS     7$                ;IF ERROR, EXIT SUBROUTINE
3217  007516  004537  005514        6$:   JSR     R5,CKTACT         ;CHK FOR TXACT = 1
3218  007522  000001                      1
3219  007524  012601              7$:     MOV     (SP)+,R1          ;RESTORE R1
3220  007526  000205                      RTS     R5                ;RETURN (IF C = 1, WE HAD AN ERROR)
3221
3222  007530  000142              20$:    TXEN!RXEN!TTLOOP          ;DEFAULT VALUE FOR VIAORB: ENABLE
3223                                                                ;TX AND RX ON USYRT, ASSERT RTS, DTR
3224
```

```
                        .SBTTL ....CKLPBK -- DETERMINE IF TEST CAN BE RUN
                        ;*****************************************************************************
                        ;* CKLPBK - THIS SUBROUTINE DETERMINES IF THE TEST CALLING IT CAN BE RUN. THE
                        ;*      TEST PASSES THE DESIRED MODEM INTERFACE TYPE IN THE WORD FOLLOWING THE
                        ;*      CALL, AND IF A PROPER EXTERNAL LOOPBACK HAS BEEN PROVIDED BY THE
                        ;*      OPERATOR FOR THAT INTERFACE, AND IF THE BAUD RATE IS CORRECT, A RETURN
                        ;*      IS MADE WITH THE C BIT CLEARED, TO RUN THE TEST. IF NOT, A RETURN IS
                        ;*      MADE WITH THE C BIT SET TO 1, SO THAT THE TEST CAN BE SKIPPED.
                        ;*
                        ;*      IF BIT 15 IS SET IN THE WORD FOLLOWING THE CALL, THE TEST WILL NOT
                        ;*      BE RUN UNLESS THE M3254 AND M3255 TEST CONNECTORS ARE INSTALLED.
                        ;*
                        ;*      IF THE PROGRAM PASSES '0' IN THE WORD FOLLOWING THE CALL, THE SUBRTN
                        ;*      WILL ATTEMPT TO RUN WHICHEVER MODEM INTERFACE IS SELECTED BY CABLE
                        ;*      OR TEST CONNECTOR.
                        ;*
                        ;*      CALLING SEQUENCE :
                        ;*         JSR  R5,CKLPBK
                        ;*         .WORD   <DESIRED MODEM INTERFACE INFO>
                        ;*
                        ;*****************************************************************************
007532                  CKLPBK:
007532  032725  100000          BIT     #TCCHEK,(R5)+   ;SEE IF M3254,5 CHECK IS DESIRED
007536  001407                  BEQ     2$              ;BR IF NOT
007540  005737  002472          TST     TSTCON          ;SEE IF M3254,5 INSTALLED
007544  001002                  BNE     1$              ;BR IF NOT
007546  000137  010072          JMP     46$             ;BR TO RUN TEST
007552  000137  010076  1$:     JMP     48$             ;GO TO SKIP TEST
                        ;IF NO EXTERNAL LPBK, SKIP TEST
007556  023727  002472  000004  2$:     CMP     TSTCON,#4       ;SEE IF NO LPBK
007564  001002                  BNE     3$              ;BR IF LOOPBACK
007566  000137  010076          JMP     48$             ;GO TO SKIP TEST

                        ;*** SEE IF AN INTERFACE IS REQUESTED ***

007572  026527  177776  000001  3$:     CMP     -2(R5),#INTGRL  ;SEE IF INTEGRAL MODEM REQUESTED
007600  001406                  BEQ     8$              ;BR IF INTGRL MODEM REQUESTED
007602  026527  177776  000002          CMP     -2(R5),#EIAV35  ;SEE IF V.35 OR EIA REQUESTED
007610  001422                  BEQ     16$             ;BR IF V.35 REQUESTED
007612  000137  007742          JMP     32$             ;NONE REQUESTED, FIND AN INTERFACE TO TEST

                        ;SEE IF INTEGRAL MODEM CAN BE RUN
007616  005737  002470  8$:     TST     BRDTYP          ;SEE IF M8064
007622  001402                  BEQ     10$             ;BR IF M8064
007624  000137  010040          JMP     42$             ;WRONG OPTION, GO TO SKIP TEST
007630  005737  002472  10$:    TST     TSTCON          ;SEE IF M3254, M3255 USED
007634  001406                  BEQ     12$             ;BR IF YES
007636  023727  002472  000001  15$:    CMP     TSTCON,#1       ;SEE IF OPERATOR SPEC'D INTEGRAL MODEM
007644  001402                  BEQ     12$             ;BR IF YES, TO RUN TEST
007646  000137  010006          JMP     40$             ;WRONG INTERFACE, GO SKIP TEST
007652  000137  010072  12$:    JMP     46$             ;GO TO RUN TEST

                        ;SEE IF V.35 OR EIA CAN BE RUN
007656  005737  002470  16$:    TST     BRDTYP          ;SEE IF M8053 BOARD
007662  001002                  BNE     18$             ;BR IF M8053
007664  000137  010040          JMP     42$             ;WRONG OPTION, GO TO SKIP TEST
```

```
3281  007670  005737  002472          18$:   TST     TSTCON          ;SEE IF M3254, M3255 USED
3282  007674  001002                         BNE     23$             ;BR IF NOT
3283  007676  000137  010072          20$:   JMP     46$             ;GO RUN THE TEST
3284  007702  023727  002472  000003  23$:   CMP     TSTCON,#3       ;SEE IF OPERATOR SPEC'D V.35
3285  007710  001006                         BNE     28$             ;BR IF NO
3286  007712  023727  002470  000001         CMP     BRDTYP,#1       ;TSTCOM MATCH BRDTYP?
3287  007720  001766                         BEQ     20$             ;YES: RUN TEST
3288  007722  000137  010006                 JMP     40$             ;WRONG INTERFACE, GO SKIP TEST
3289
3290  007726  023727  002472  000002  28$:   CMP     TSTCON,#2       ;SEE IF OPERATOR SPEC'D EIA
3291  007734  001760                         BEQ     20$             ;BR IF YES, TO RUN EIA
3292  007736  000137  010006                 JMP     40$             ;WRONG INTERFACE, GO SKIP TEST
3293
3294                                 ;*** NO INTERFACE REQUESTED - FIND ONE TO TEST ***
3295
3296  007742  005737  002470          32$:   TST     BRDTYP          ;SEE IF INTEGRAL MODEM SELECTED
3297  007746  001343                         BNE     16$             ;BR IF NOT (TEST FOR V35/EIA)
3298  007750  000137  007652                 JMP     12$             ;SEE IF INTEGRAL MODEM CAN BE RUN
3299
3300                                 ;PRINT "FOR BAUD RATE SPECIFIED."
3301  007754                         36$:
3302  007754  023727  002412  000001         CMP     STARES,#1       ;SEE IF THIS IS FIRST PASS SINCE STA OR RES
3303  007762  001063                         BNE     50$             ;BR IF NOT, TO SKIP PRINTING
3304  007764                                 PRINTF  #FMT30
3305  007764  012746  013762                                                 MOV     #FMT30,-(SP)
3306  007770  012746  000001                                                 MOV     #1,-(SP)
3307  007774  010600                                                         MOV     SP,R0
3308  007776  104417                                                         TRAP    C$PNTF
3309  010000  062706  000004                                                 ADD     #4,SP
3310  010004  000434                         BR      48$             ;GO TO PRINT "TEST NOT RUN"
3311                                 ;PRINT "IMPROPER CONNECTOR TYPE SPECIFIED"
3312  010006                         40$:
3313  010006  023727  002412  000001         CMP     STARES,#1       ;SEE IF THIS IS FIRST PASS SINCE STA OR RES
3314  010014  001046                         BNE     50$             ;BR IF NOT, TO SKIP PRINTING
3315  010016                                 PRINTF  #FMT31          ; **********
3316  010016  012746  014017                                                 MOV     #FMT31,-(SP)
3317  010022  012746  000001                                                 MOV     #1,-(SP)
3318  010026  010600                                                         MOV     SP,R0
3319  010030  104417                                                         TRAP    C$PNTF
3320  010032  062706  000004                                                 ADD     #4,SP
3321  010036  000417                         BR      48$             ;GO TO PRINT "TEST NOT RUN"
3322
3323                                 ;PRINT "FOR OPTION SPECIFIED."
3324  010040  023727  002412  000001  42$:   CMP     STARES,#1       ;SEE IF THIS IS FIRST PASS SINCE STA OR RES
3325  010046  001031                         BNE     50$             ;BR IF NOT TO SKIP PRINTING
3326  010050                                 PRINTF  #FMT32
3327  010050  012746  014065                                                 MOV     #FMT32,-(SP)
3328  010054  012746  000001                                                 MOV     #1,-(SP)
3329  010060  010600                                                         MOV     SP,R0
3330  010062  104417                                                         TRAP    C$PNTF
3331  010064  062706  000004                                                 ADD     #4,SP
3332  010070  000402                         BR      48$             ;GO TO PRINT "TEST NOT RUN"
3333
3334                                 ;*** BRANCH HERE TO RUN TEST ***
3335  010072  000241          46$:   CLC                             ;CLEAR C BIT TO RUN TEST
3336  010074  000417                 BR      52$                     ;EXIT
```

....CKLPBK -- DETERMINE IF TEST CAN BE RUN

```
3337
3338                                    ;*** BRANCH HERE TO SKIP TEST ***
3339                                    ;PRINT "TEST XX NOT RUN"
3340   010076                           48$:
3341   010076  023727  002412  000001          CMP     STARES,#1       ;SEE IF THIS IS FIRST PASS SINCE STA OR RES
3342   010104  001012                          BNE     50$             ;BR IF NOT, TO SKIP PRINTING
3343   010106                                  PRINTF  #FMT19,TSTNUM
3344   010106  013746  002414                                                  MOV     TSTNUM,-(SP)
3345   010112  012746  013452                                                  MOV     #FMT19,-(SP)
3346   010116  012746  000002                                                  MOV     #2,-(SP)
3347   010122  010600                                                          MOV     SP,R0
3348   010124  104417                                                          TRAP    C$PNTF
3349   010126  062706  000006                                                  ADD     #6,SP
3350   010132  000261                  50$:    SEC                     ;SET C BIT TO SKIP TEST
3351   010134  000205                  52$:    RTS     R5              ;RETURN
3352
3353
3354
```

```
                                .SBTTL ....TXCHAR -- TRANSMIT A CHARACTER
                                ;*****************************************************************************
                                ;* TXCHAR - THIS SUBROUTINE INITIATES TRANSMISSION OF A CHAR BY LOADING
                                ;*      THE USYRT TDSRL WITH THE DATA PASSED IN THE LO BYTE OF THE WORD
                                ;*      FOLLOWING THE CALL, AND CLOCKS THE LINE UNIT WITH THE NUMBER OF CYCLES
                                ;*      PASSED IN THE SECOND WORD FOLLOWING THE CALL. THE PROGRAM CONTINUALLY
                                ;*      MONITORS TBMT AND TXACT THROUGHOUT THE PROCESS.
                                ;*      IF THE SUBROUTINE DETECTS AN ERROR, THE ERROR INFORMATION
                                ;*      IS STACKED, AND THE C-BIT SET, WHICH LEAVES THE ERROR REPORTING AT THE
                                ;*      DISCRETION OF THE CALLING ROUTINE OR SUBROUTINE.
                                ;*
                                ;*      CALLING SEQUENCE :
                                ;*      JSR     R5,TXCHAR
                                ;*      .WORD   <DATA FOR TDSRL IN LO BYTE>
                                ;*      .WORD   <NUMBER OF CYCLES TO CLOCK (IN LO BYTE)>
                                ;*              <SWITCH TO DISABLE INITIAL TBMT=0 CHECK (MSB IN HI BYTE)>
                                ;*****************************************************************************
010136                          TXCHAR:
010136  010146                          MOV     R1,-(SP)        ;SAVE R1
010140  010246                          MOV     R2,-(SP)        ;SAVE R2
010142  012537  010154                  MOV     (R5)+,1$        ;GET DATA FOR TDSRL
010146  004537  003712                  JSR     R5,WRITEI       ;LOAD DATA INTO TDSRL
010152  120402                          TDSRL
010154  000000                  1$:     .WORD   0
010156  005001                          CLR     R1              ;INIT CYCLE COUNT AND CLEAR C BIT
010160  005002                          CLR     R2              ;CLEAR REQ'D CYCLE COUNT
010162  112502                          MOVB    (R5)+,R2        ;GET DESIRED NO. OF CYCLES
010164  001425                          BEQ     6$              ;BR IF NO CLOCKING DONE
010166  004537  005514          3$:     JSR     R5,CKTACT       ;CHECK TXACT = 1
010172  000001                          1
010174  103421                          BCS     6$              ;BR TO EXIT IF ERROR
010176  020102                          CMP     R1,R2           ;SEE IF REQUIRED CYCLES DONE YET
010200  001414                          BEQ     5$              ;BR IF YES
                                
010202  131527  000200                  BITB    (R5),@#CTBMT    ;* CHECK FOR "TBMT=0 CHECK" DISABLE
010206  001004                          BNE     7$              ;* BR IF MSB IS NOT SET
                                
010210  004537  006014                  JSR     R5,CKTBMT       ;CHECK FOR TBMT = 0
010214  000000                          0
010216  103410                          BCS     6$              ;BR TO EXIT IF ERROR
010220  004537  012072          7$:     JSR     R5,STEPLU       ;CLOCK LU FOR 1 CYCLE
010224  000001                          1
010226  005201                          INC     R1              ;INCR CYCLE COUNT
010230  000756                          BR      3$              ;KEEP CLOCKING
010232  004537  006014          5$:     JSR     R5,CKTBMT       ;CHK TBMT = 1
010236  000001                          1
010240  012602                  6$:     MOV     (SP)+,R2        ;RESTORE R2
010242  012601                          MOV     (SP)+,R1        ;RESTORE R1
010244  005205                          INC     R5              ;ADJUST R5 FOR SANE RETURN
010246  000205                          RTS     R5              ;RETURN (WITH C BIT = 1 IF ERROR)
```

```
                                .SBTTL ....TXCTRL -- CONTROL MESSAGE TRANSMISSION (TDSRH)
                                ;**********************************************************************
                                ;* TXCTRL - THIS SUBROUTINE ALLOWS CONTROL OF MESSAGE TRANSMISSION BY LOADING
                                ;*      THE USYRT TDSRH WITH THE DATA PASSED IN THE LO BYTE OF THE WORD
                                ;*      FOLLOWING THE CALL, AND CLOCKS THE LINE UNIT WITH THE NUMBER OF CYCLES
                                ;*      PASSED IN THE SECOND WORD FOLLOWING THE CALL. THE PROGRAM CONTINUALLY
                                ;*      MONITORS TBMT AND TXACT THROUGHOUT THE PROCESS.
                                ;*      IF THE SUBROUTINE DETECTS AN ERROR, THE ERROR INFORMATION
                                ;*      IS STACKED, AND THE C-BIT SET, WHICH LEAVES THE ERROR REPORTING AT THE
                                ;*      DISCRETION OF THE CALLING ROUTINE OR SUBROUTINE.
                                ;*
                                ;*      CALLING SEQUENCE :
                                ;*      JSR     R5,TXCTRL
                                ;*      .WORD   <DATA FOR TDSRH IN LO BYTE>
                                ;*      .WORD   <NUMBER OF CYCLES TO CLOCK>
                                ;**********************************************************************
010250                          TXCTRL:
010250  010146                         MOV     R1,-(SP)        ;SAVE R1
010252  010246                         MOV     R2,-(SP)        ;SAVE R2
010254  012537  010266                 MOV     (R5)+,2$        ;GET DATA FOR TDSRH
010260  004537  003712                 JSR     R5,WRITEI       ;LOAD DATA INTO TDSRH
010264  120403                         TDSRH
010266  000000                 2$:     .WORD   0
010270  005001                         CLR     R1              ;INIT CYCLE COUNT AND CLEAR C BIT
010272  012502                         MOV     (R5)+,R2        ;GET DESIRED NO. OF CYCLES
010274  001422                         BEQ     6$              ;BR IF NO CLOCKING DONE
010276  004537  005514         3$:     JSR     R5,CKTACT       ;CHECK TXACT = 1
010302  000001                         1
010304  103416                         BCS     6$              ;BR TO EXIT IF ERROR
010306  020102                         CMP     R1,R2           ;SEE IF REQUIRED CYCLES DONE YET
010310  001411                         BEQ     5$              ;BR IF YES
010312  004537  006014                 JSR     R5,CKTBMT       ;CHECK FOR TBMT = 0
010316  000000                         0
010320  103410                         BCS     6$              ;BR TO EXIT IF ERROR
010322  004537  012072                 JSR     R5,STEPLU       ;CLOCK LU FOR 1 CYCLE
010326  000001                         1
010330  005201                         INC     R1              ;INCR CYCLE COUNT
010332  000761                         BR      3$              ;KEEP CLOCKING
010334  004537  006014         5$:     JSR     R5,CKTBMT       ;CHK TBMT = 1
010340  000001                         1
010342  012602                 6$:     MOV     (SP)+,R2        ;RESTORE R2
010344  012601                         MOV     (SP)+,R1        ;RESTORE R1
010346  000205                         RTS     R5              ;RETURN (WITH C BIT = 1 IF ERROR)
```

```
                        .SBTTL ....RXCHAR -- RECEIVE A CHARACTER
                        ;*************************************************************************
                        ;* RXCHAR - THIS SUBROUTINE READS THE USYRT RDSR AND CHECKS THE CONTENTS
                        ;*      AGAINST THE DATA PASSED IN THE WORD FOLLOWING THE CALL.
                        ;*      IF BIT0 = 0 IN THE SECOND WORD FOLLOWING THE CALL, THE RERR BIT IS
                        ;*      NOT CHECKED AGAINST THE EXPECTED VALUE. THEN, IT CLOCKS
                        ;*      THE LINE UNIT FOR THE NO. OF CYCLES PASSED IN THE THIRD WORD
                        ;*      FOLLOWING THE CALL. THE PROGRAM CONTINUALLY MONITORS RDA AND RXACT.
                        ;*      IF THE SUBROUTINE DETECTS AN ERROR, THE ERROR INFORMATION
                        ;*      IS STACKED, AND THE C-BIT SET, WHICH LEAVES THE ERROR REPORTING AT THE
                        ;*      DISCRETION OF THE CALLING ROUTINE OR SUBROUTINE.
                        ;*
                        ;*      CALLING SEQUENCE :
                        ;*      JSR     R5,RXCHAR
                        ;*      .WORD   <EXPECTED RDSRL IN LO BYTE, RDSRH IN HI BYTE>
                        ;*      .WORD   <=0 FOR NO RERR CHK, =1 FOR RERR CHK>
                        ;*      .WORD   <NUMBER OF CYCLES TO CLOCK (IN LO BYTE)>
                        ;*              <SPECIAL DISABLE SWITCHES: NOCRDA,NFCRDA,NCRACT(IN HI BYTE)>
                        ;*************************************************************************
010350                  RXCHAR:
010350  010146                  MOV     R1,-(SP)        ;SAVE R1
010352  010246                  MOV     R2,-(SP)        ;SAVE R2
010354  004537  003566          JSR     R5,READI        ;READ RDSRH
010360  120401                  RDSRH
010362  000000          2$:     .WORD   0
010364  004537  003566          JSR     R5,READI        ;READ RDSRL
010370  120400                  RDSRL
010372  000000          1$:     .WORD   0
010374  111501                  MOVB    (R5),R1         ;GET EXPECTED RDSRL
010376  042701  177400          BIC     #177400,R1      ;MASK OFF UNUSED BITS
010402  023727  002402  000347  CMP     SAVLEN,#TXDL!RXDL ;SEE IF 7-BIT CHARS BEING USED
010410  001005                  BNE     3$              ;BR IF NOT 7-BIT CHARS
010412  142737  000200  010372  BICB    #BIT7,1$        ;CLEAR 8TH BIT FOR COMPARE
010420  142701  000200          BICB    #BIT7,R1
010424  123701  010372  3$:     CMPB    1$,R1           ;COMPARE RCV'D CHAR TO EXPECTED
010430  001462                  BEQ     6$              ;BR IF MATCH
010432  004537  003566          JSR     R5,READI        ;READ USYRT STATUS REG
010436  122000                  USTATR
010440  000000          4$:     .WORD   0
010442  132737  000002  010440  BITB    #TXU,4$         ;SEE IF TX UNDERRUN OCCURRED
010450  001421                  BEQ     5$              ;BR IF NOT
010452  012737  000007  002336  MOV     #7,REGNUM       ;SET USYRT REG NO. FOR STATUS REG
                        ;STACK "TX UNDERRUN" ERROR
010460                  GTDF    EM54,ERR12
                        ;       QUEUE "DEVICE FATAL" ERROR # 26
010460  012737  000001  002172                          MOV     #T.EDF,ERRTYP
010466  012737  000032  002174                          MOV     #26.,ERRNBR
010474  012737  014626  002176                          MOV     #EM54,ERRMSG
010502  012737  020714  002200                          MOV     #ERR12,ERRBLK
010510  000137  011610          JMP     20$             ;TAKE ERROR EXIT
010514  005037  002336  5$:     CLR     REGNUM          ;SET USYRT REG NO. FOR RDSRL
010520  005037  002324          CLR     GDATA           ;SET EXPECTED DATA
010524  110137  002324          MOVB    R1,GDATA
010530  005037  002326          CLR     BDATA           ;SET ACTUAL DATA
010534  113737  010372  002326  MOVB    1$,BDATA
                        ;STACK "RCV'D DATA MISCOMPARE" ERROR
```

```
3510  010542                                        GTDF    EM34,ERR10
3511                                                ;       QUEUE "DEVICE FATAL" ERROR # 27
3512  010542  012737  000001  002172                                    MOV     #T.EDF,ERRTYP
3513  010550  012737  000033  002174                                    MOV     #27,ERRNBR
3514  010556  012737  014502  002176                                    MOV     #EM34,ERRMSG
3515  010564  012737  020364  002200                                    MOV     #ERR10,ERRBLK
3516  010572  000137  011610                        JMP     20$             ;TAKE ERROR EXIT
3517  010576  116501  000001              6$:       MOVB    1(R5),R1        ;GET RDSRH
3518  010602  042701  177400                        BIC     #177400,R1      ;MASK OFF UNUSED BITS
3519  010606  123701  010362                        CMPB    2$,R1           ;COMPARE RCV'D STATUS TO EXPECTED
3520  010612  001016                                BNE     7$              ;BR IF MISMATCH
3521  010614  000137  011474                        JMP     17$             ;CONTINUE
3522  010620  012737  000001  002336                MOV     #1,REGNUM       ;SET USYRT REG NO. FOR RDSRH
3523  010626  005037  002324                        CLR     GDATA           ;SET EXPECTED DATA
3524  010632  110137  002324                        MOVB    R1,GDATA
3525  010636  005037  002326                        CLR     BDATA           ;SET ACTUAL DATA
3526  010642  113737  010362  002326                MOVB    2$,BDATA
3527  010650  012737  000001  002336      7$:       MOV     #1,REGNUM       ;SET REG NO. FOR PRINTOUT
3528  010656  032765  000001  000002                BIT     #RERCHK,2(R5)   ;SEE IF RCV ERROR BIT SHOULD BE IGNORED
3529  010664  001447                                BEQ     9$              ;BR IF YES
3530                                      ;CHECK RERR BIT
3531  010666  132701  000200                        BITB    #RERR,R1        ;SEE IF EXPECTED BIT = 1
3532  010672  001022                                BNE     8$              ;BR IF YES
3533  010674  132737  000200  010362                BITB    #RERR,2$        ;SEE IF ACTUAL BIT = 0
3534  010702  001440                                BEQ     9$              ;BR IF YES
3535                                      ;STACK "RERR NOT CLEARED" MSG
3536  010704                                        GTDF    EM35,ERR12
3537                                                ;       QUEUE "DEVICE FATAL" ERROR # 28
3538  010704  012737  000001  002172                                    MOV     #T.EDF,ERRTYP
3539  010712  012737  000034  002174                                    MOV     #28,ERRNBR
3540  010720  012737  014530  002176                                    MOV     #EM35,ERRMSG
3541  010726  012737  020714  002200                                    MOV     #ERR12,ERRBLK
3542  010734  000137  011610                        JMP     20$             ;TAKE ERROR EXIT
3543  010740  132737  000200  010362      8$:       BITB    #RERR,2$        ;SEE IF ACTUAL BIT = 1
3544  010746  001016                                BNE     9$              ;BR IF YES
3545                                      ;STACK "RERR NOT SET" MSG
3546  010750                                        GTDF    EM36,ERR12
3547                                                ;       QUEUE "DEVICE FATAL" ERROR # 29
3548  010750  012737  000001  002172                                    MOV     #T.EDF,ERRTYP
3549  010756  012737  000035  002174                                    MOV     #29,ERRNBR
3550  010764  012737  014551  002176                                    MOV     #EM36,ERRMSG
3551  010772  012737  020714  002200                                    MOV     #ERR12,ERRBLK
3552  011000  000137  011610                        JMP     20$             ;TAKE ERROR EXIT
3553                                      ;CHECK ROR BIT
3554  011004  132701  000010              9$:       BITB    #ROR,R1         ;SEE IF EXPECTED BIT = 1
3555  011010  001022                                BNE     10$             ;BR IF YES
3556  011012  132737  000010  010362                BITB    #ROR,2$         ;SEE IF ACTUAL BIT = 0
3557  011020  001440                                BEQ     11$             ;BR IF YES
3558                                      ;STACK "ROR NOT CLEARED" MSG
3559  011022                                        GTDF    EM16,ERR12
3560                                                ;       QUEUE "DEVICE FATAL" ERROR # 30
3561  011022  012737  000001  002172                                    MOV     #T.EDF,ERRTYP
3562  011030  012737  000036  002174                                    MOV     #30,ERRNBR
3563  011036  012737  014340  002176                                    MOV     #EM16,ERRMSG
3564  011044  012737  020714  002200                                    MOV     #ERR12,ERRBLK
3565  011052  000137  011610                        JMP     20$             ;TAKE ERROR EXIT
```

```
3566  011056  132737  000010  010362  10$:    BITB    #ROR,2$         ;SEE IF ACTUAL BIT = 1
3567  011064  001016                          BNE     11$             ;BR IF YES
3568                                  ;STACK "ROR NOT SET" MSG
3569  011066                                  GTDF    EM14,ERR12
3570                                          ;       QUEUE "DEVICE FATAL" ERROR # 31
3571  011066  012737  000001  002172                                  MOV     #T.EDF,ERRTYP
3572  011074  012737  000037  002174                                  MOV     #31,ERRNBR
3573  011102  012737  014324  002176                                  MOV     #EM14,ERRMSG
3574  011110  012737  020714  002200                                  MOV     #ERR12,ERRBLK
3575  011116  000137  011610                  JMP     20$             ;TAKE ERROR EXIT
3576                                  ;CHECK RABGA BIT
3577  011122  132701  000004          11$:    BITB    #RABGA,R1       ;SEE IF EXPECTED BIT = 1
3578  011126  001022                          BNE     12$             ;BR IF YES
3579  011130  132737  000004  010362          BITB    #RABGA,2$       ;SEE IF ACTUAL BIT = 0
3580  011136  001440                          BEQ     13$             ;BR IF YES
3581                                  ;STACK "RABGA NOT CLEARED" MSG
3582  011140                                  GTDF    EM39,ERR12
3583                                          ;       QUEUE "DEVICE FATAL" ERROR # 32
3584  011140  012737  000001  002172                                  MOV     #T.EDF,ERRTYP
3585  011146  012737  000040  002174                                  MOV     #32,ERRNBR
3586  011154  012737  014566  002176                                  MOV     #EM39,ERRMSG
3587  011162  012737  020714  002200                                  MOV     #ERR12,ERRBLK
3588  011170  000137  011610                  JMP     20$             ;TAKE ERROR EXIT
3589  011174  132737  000004  010362  12$:    BITB    #RABGA,2$       ;SEE IF ACTUAL BIT = 1
3590  011202  001016                          BNE     13$             ;BR IF YES
3591                                  ;STACK "RABGA NOT SET" MSG
3592  011204                                  GTDF    EM40,ERR12
3593                                          ;       QUEUE "DEVICE FATAL" ERROR # 33
3594  011204  012737  000001  002172                                  MOV     #T.EDF,ERRTYP
3595  011212  012737  000041  002174                                  MOV     #33,ERRNBR
3596  011220  012737  014610  002176                                  MOV     #EM40,ERRMSG
3597  011226  012737  020714  002200                                  MOV     #ERR12,ERRBLK
3598  011234  000137  011610                  JMP     20$             ;TAKE ERROR EXIT
3599                                  ;CHECK REOM BIT
3600  011240  132701  000002          13$:    BITB    #REOM,R1        ;SEE IF EXPECTED BIT = 1
3601  011244  001022                          BNE     14$             ;BR IF YES
3602  011246  132737  000002  010362          BITB    #REOM,2$        ;SEE IF ACTUAL BIT = 0
3603  011254  001440                          BEQ     15$             ;BR IF YES
3604                                  ;STACK "REOM NOT CLEARED" MSG
3605  011256                                  GTDF    EM30,ERR12
3606                                          ;       QUEUE "DEVICE FATAL" ERROR # 34
3607  011256  012737  000001  002172                                  MOV     #T.EDF,ERRTYP
3608  011264  012737  000042  002174                                  MOV     #34,ERRNBR
3609  011272  012737  014444  002176                                  MOV     #EM30,ERRMSG
3610  011300  012737  020714  002200                                  MOV     #ERR12,ERRBLK
3611  011306  000137  011610                  JMP     20$             ;TAKE ERROR EXIT
3612  011312  132737  000002  010362  14$:    BITB    #REOM,2$        ;SEE IF ACTUAL BIT = 1
3613  011320  001016                          BNE     15$             ;BR IF YES
3614                                  ;STACK "REOM NOT SET" MSG
3615  011322                                  GTDF    EM31,ERR12
3616                                          ;       QUEUE "DEVICE FATAL" ERROR # 35
3617  011322  012737  000001  002172                                  MOV     #T.EDF,ERRTYP
3618  011330  012737  000043  002174                                  MOV     #35,ERRNBR
3619  011336  012737  014465  002176                                  MOV     #EM31,ERRMSG
3620  011344  012737  020714  002200                                  MOV     #ERR12,ERRBLK
3621  011352  000137  011610                  JMP     20$             ;TAKE ERROR EXIT
```

```
3622                                    ;CHECK RSOM BIT
3623  011356  132701  000001            15$:    BITB    #RSOM,R1        ;SEE IF EXPECTED BIT = 1
3624  011362  001022                            BNE     .16$            ;BR IF YES
3625  011364  132737  000001  010362            BITB    #RSOM,2$        ;SEE IF ACTUAL BIT = 0
3626  011372  001440                            BEQ     17$             ;BR IF YES
3627                                    ;STACK "RSOM NOT CLEARED" MSG
3628  011374                                    GTDF    EM28,ERR12
3629                                                    ;       QUEUE "DEVICE FATAL" ERROR # 36
3630  011374  012737  000001  002172                                                    MOV     #T.EDF,ERRTYP
3631  011402  012737  000044  002174                                                    MOV     #36,ERRNBR
3632  011410  012737  014406  002176                                                    MOV     #EM28,ERRMSG
3633  011416  012737  020714  002200                                                    MOV     #ERR12,ERRBLK
3634  011424  000137  011610                    JMP     20$             ;TAKE ERROR EXIT
3635  011430  132737  000001  010362  16$:     BITB    #RSOM,2$        ;SEE IF ACTUAL BIT = 1
3636  011436  001016                            BNE     17$             ;BR IF YES
3637                                    ;STACK "RSOM NOT SET" MSG
3638  011440                                    GTDF    EM29,ERR12
3639                                                    ;       QUEUE "DEVICE FATAL" ERROR # 37
3640  011440  012737  000001  002172                                                    MOV     #T.EDF,ERRTYP
3641  011446  012737  000045  002174                                                    MOV     #37,ERRNBR
3642  011454  012737  014427  002176                                                    MOV     #EM29,ERRMSG
3643  011462  012737  020714  002200                                                    MOV     #ERR12,ERRBLK
3644  011470  000137  011610                    JMP     20$             ;TAKE ERROR EXIT
3645
3646  011474  116502  000004            17$:    MOVB    4(R5),R2        ;GET DESIRED NO. OF CYCLES
3647  011500  005001                            CLR     R1              ;INIT CYCLE COUNT
3648
3649  011502  136527  000005  000040  18$:     BITB    5(R5),#BIT5     ;* IS RXACT CHECK TO BE DISABLED ?
3650  011510  001004                            BNE     31$             ;* BR IF YES
3651  011512  004537  005654                    JSR     R5,CKRACT       ;CHK FOR RACT = 1
3652  011516  000001                            1
3653  011520  103433                            BCS     20$             ;BR TO EXIT IF ERROR
3654
3655  011522  020102                    31$:    CMP     R1,R2           ;SEE IF REQUIRED CYCLES DONE YET
3656  011524  001415                            BEQ     19$             ;BR IF YES
3657
3658  011526  136527  000005  000200            BITB    5(R5),#BIT7     ;* SEE IF INITIAL RDA CHECK DESIRED
3659  011534  001004                            BNE     22$             ;* BR IF NO
3660  011536  004537  006154                    JSR     R5,CKRDA        ;CHK FOR RDA = 0
3661  011542  000000                            0
3662  011544  103421                            BCS     20$             ;BR TO EXIT IF ERROR
3663
3664  011546  004537  012072            22$:    JSR     R5,STEPLU       ;CLOCK LU FOR 1 CYCLE
3665  011552  000001                            1
3666  011554  005201                            INC     R1              ;INCR CYCLE COUNT
3667  011556  000751                            BR      18$             ;CONTINUE CLOCKING
3668
3669  011560  136527  000005  000100  19$:     BITB    5(R5),#BIT6     ;* IS FINAL RDA CHECK TO BE SKIPPED ?
3670  011566  001004                            BNE     30$             ;* BR IF YES
3671  011570  004537  006154                    JSR     R5,CKRDA        ;CHK RDA = 1
3672  011574  000001                            1
3673  011576  103404                            BCS     20$             ;BR IF ERROR
3674
3675  011600  062705  000006            30$:    ADD     #6,R5           ;FIX UP RETURN ADRS
3676  011604  000241                            CLC                     ;SET C = 0 FOR NO ERROR
3677  011606  000403                            BR      21$             ;TAKE ERROR-FREE EXIT
```

J7


```
 3678  011610  062705  000006          20$:    ADD     #6,R5           ;FIX UP RETURN ADDRESS
 3679  011614  000261                          SEC                     ;SET C BIT FOR ERROR
 3680  011616  012602                  21$:    MOV     (SP)+,R2        ;RESTORE R2
 3681  011620  012601                          MOV     (SP)+,R1        ;RESTORE R1
 3682  011622  000205                          RTS     R5              ;RETURN
 3683
```

```
                        .SBTTL ....RCV1ST -- RECEIVE FIRST CHARACTER OF MESSAGE
                        ;*****************************************************************************
                        ;* RCV1ST - THIS SUBROUTINE RECEIVES THE FIRST CHAR OF A MESSAGE AND MONITORS
                        ;*      THE STATUS OF THE RECEIVER. FIRST, A CHECK IS MADE FOR RXACT = 0,
                        ;*      RDA = 0, RSA = 0, RSOM = 0. THEN, THE LINE UNIT IS CLOCKED UNTIL
                        ;*      RDA = 1. THE PROGRAM CHECKS FOR THIS TO OCCUR WITHIN 3 CYCLES AFTER
                        ;*      THE NO. OF CYCLES PASSED IN THE SECOND WORD FOLLOWING THE CALL.
                        ;*      IF THE SUBROUTINE DETECTS AN ERROR, THE ERROR INFORMATION
                        ;*      IS STACKED, AND THE C-BIT SET, WHICH LEAVES THE ERROR REPORTING AT THE
                        ;*      DISCRETION OF THE CALLING ROUTINE OR SUBROUTINE.
                        ;*
                        ;*      CALLING SEQUENCE :
                        ;*      JSR     R5,RCV1ST
                        ;*      .WORD   <EXPECTED RECEIVER CYCLE COUNT>
                        ;*****************************************************************************
011624                  RCV1ST:
011624  010146                  MOV     R1,-(SP)        ;SAVE R1
011626  010246                  MOV     R2,-(SP)        ;SAVE R2
011630  005001                  CLR     R1              ;INIT CYCLE COUNT
011632  012502                  MOV     (R5)+,R2                ;GET CYCLE COUNT LIMIT
011634  062702  000003          ADD     #3,R2
011640  004537  005654          JSR     R5,CKRACT       ;CHK FOR RXACT = 0
011644  000000                  0
011646  103446                  BCS     6$              ;BR TO EXIT IF ERROR
011650  004537  006154          JSR     R5,CKRDA        ;CHK FOR RDA = 0
011654  000000                  0
011656  103442                  BCS     6$              ;BR TO EXIT IF ERROR
011660  004537  006614          JSR     R5,CKSEOM       ;CHK FOR RSOM = 0, REOM = 0
011664  000000                  0
011666  103436                  BCS     6$              ;BR TO EXIT IF ERROR
011670  004537  012072  1$:     JSR     R5,STEPLU       ;CLOCK LU FOR 1 CYCLE
011674  000001                  1
011676  005201                  INC     R1              ;INCREMENT CYCLE COUNT
011700  004537  003566          JSR     R5,READI        ;READ USYRT STATUS REG
011704  122000                  USTATR
011706  000000          2$:     .WORD   0
011710  132737  000200  011706  BITB    #RDA,2$         ;SEE IF RDA SET YET
011716  001006                  BNE     3$              ;BR IF YES
011720  020102                  CMP     R1,R2           ;SEE IF LIMIT EXCEEDED
011722  002762                  BLT     1$              ;BR IF NOT YET
011724  004537  006154          JSR     R5,CKRDA        ;GO STACK "RDA NOT SET" MSG
011730  000001                  1
011732  103414                  BCS     6$              ;BR TO EXIT IF ERROR
011734  020165  177776  3$:     CMP     R1,-2(R5)       ;SEE IF LESS THAN REQUIRED CYCLES
011740  002004                  BGE     4$              ;BR IF NOT
011742  004537  006154          JSR     R5,CKRDA        ;GO STACK "RDA NOT CLEARED" MSG
011746  000000                  0
011750  103405                  BCS     6$              ;BR TO EXIT IF ERROR
```

L7


```
 3732  011752  004537  005654          4$:     JSR     R5,CKRACT       ;CHK FOR RXACT = 1
 3733  011756  000001                          1
 3734  011760  103401                          BCS     6$              ;BR TO EXIT IF ERROR
 3735  011762  000241                  5$:     CLC                     ;CLEAR C BIT FOR NO ERRORS
 3736  011764  012602                  6$:     MOV     (SP)+,R2        ;RESTORE R2
 3737  011766  012601                          MOV     (SP)+,R1        ;RESTORE R1
 3738  011770  000205                          RTS     R5              ;RETURN (WITH C BIT = 1 IF ERROR)
 3739
 3740
```

```
                                .SBTTL ....ENTRAN -- SHUT DOWN TRANSMITTER/RECEIVER
                                ;**************************************************************************
                                ;* ENTRAN - THIS SUBROUTINE TERMINATES A MESSAGE BY CLEARING TXEN AND RXEN,
                                ;*      CLOCKING THE LINE UNIT FOR THE NUMBER OF CYCLES PASSED IN THE WORD
                                ;*      FOLLOWING THE CALL, AND CHECKING FOR THE USYRT TRANSMITTER AND
                                ;*      RECEIVER TO BE SHUT DOWN.
                                ;*      IF THE SUBROUTINE DETECTS AN ERROR, THE ERROR INFORMATION
                                ;*      IS STACKED, AND THE C-BIT SET, WHICH LEAVES THE ERROR REPORTING AT THE
                                ;*      DISCRETION OF THE CALLING ROUTINE OR SUBROUTINE.
                                ;*
                                ;*      CALLING SEQUENCE :
                                ;*        JSR   R5,ENTRAN
                                ;*        MSB SET=NO TTLOOP ! LOWER BYTE = <NO. OF CYCLES TO CLOCK>
                                ;**************************************************************************
011772                          ENTRAN:
011772  012737  000002  012042          MOV     #TTLOOP,1$      ;INIT DEFAULT VIAORB (TTLOOP=1)
012000  112537  012050          4$:     MOVB    (R5)+,2$        ;GET DESIRED # OF TICKS (LOWER BYTE)
012004  105725                          TSTB    (R5)+           ;SEE IF MSB SET (TTLOOP DISABLE BIT)
012006  100002                          BPL     4$              ;IS IT?
012010  005037  012042                  CLR     1$              ;IF YES: CLEAR VIAORB VALUE
012014  004537  005514                  JSR     R5,CKTACT       ;CHK FOR TXACT = 1
012020  000001                          1
012022  103422                          BCS     6$              ;BR IF ERROR
012024  004537  005654                  JSR     R5,CKRACT       ;CHK FOR RXACT = 1
012030  000001                          1
012032  103416                          BCS     6$
012034  004537  003712                  JSR     R5,WRITEI       ;CLEAR TXEN AND RXEN IN USYRT
012040  120000                          VIAORB                  ;
012042  000002          1$:     TTLOOP                          ;** HOLE FOR ACTUAL VIAORB WORD **
012044  004537  012072                  JSR     R5,STEPLU       ;CLOCK LU FOR DESIRED NO. OF CYCLES
012050  000000          2$:     .WORD   0
012052  004537  005514                  JSR     R5,CKTACT       ;CHK FOR TXACT = 0
012056  000000                          0
012060  103403                          BCS     6$              ;BR IF ERROR
012062  004537  005654                  JSR     R5,CKRACT       ;CHK FOR RXACT = 0
012066  000000                          0
012070  000205          6$:     RTS     R5
```

```
3780                                    .SBTTL ....STEPLU -- CLOCK THE USYRT N TIMES
3781                                    ;**********************************************************************
3782                                    ;* STEPLU - THIS SUBROUTINE CLOCKS THE LINE UNIT FOR THE NUMBER OF CYCLES
3783                                    ;*       PASSED IN THE WORD FOLLOWING THE CALL. THE VIA ACR MUST BE PREVIOUSLY
3784                                    ;*       SET UP FOR T1 ONE-SHOT MODE, AND THE T1 LATCHES MUST BE PREVIOUSLY SET
3785                                    ;*       TO CONTROL THE WIDTH OF THE CLOCK PULSE. ALL THAT THIS SUBROUTINE
3786                                    ;*       DOES IS TO LOAD 000 INTO THE HI BYTE OF THE T1 COUNTER, FOR THE
3787                                    ;*       DESIRED NUMBER OF TIMES.
3788                                    ;*
3789                                    ;*       CALLING SEQUENCE :
3790                                    ;*       JSR     R5,STEPLU
3791                                    ;*       .WORD   <NUMBER OF CYCLES TO CLOCK>
3792                                    ;**********************************************************************
3793  012072                            STEPLU:
3794  012072  010146                           MOV     R1,-(SP)        ;SAVE R1
3795  012074  012501                           MOV     (R5)+,R1        ;INIT CYCLE COUNTER
3796  012076  004537  003712           1$:     JSR     R5,WRITEI       ;LOAD T1C-H, START COUNTER, CLOCK 1 CYCLE
3797  012102  120005                           VIAT1B
3798  012104  000000                           000
3799  012106  005301                           DEC     R1              ;DECR CYCLE COUNTER
3800  012110  001372                           BNE     1$              ;BR IF ALL CYCLES NOT DONE YET
3801  012112  012601                           MOV     (SP)+,R1        ;RESTORE R1
3802  012114  000205                           RTS     R5              ;RETURN
3803
3804
3805
3806
3807
3808
```

```
                        .SBTTL  GLOBAL ERROR REPORT SECTION

                        ;////////////////////////////////////////////////////////////////////
                        ;/      THE GLOBAL ERROR REPORT SECTION CONTAINS ERROR MESSAGES
                        ;/      THAT ARE USED IN MORE THAN ONE TEST.
                        ;////////////////////////////////////////////////////////////////////

                        .NLIST  BEX
012116 047045 047045 000 ENDEMB: .ASCIZ  /%N%N/
012123    045 000116    NEWLIN: .ASCIZ  /%N/            ;USED TO TERMINATE ERROR MESSAGES

012126 047045 040445 040506 FMT2:   .ASCIZ  /%N%AFAILING REG = %T%ASEL%O1/
012163    045 022516 020101 FMT3:   .ASCIZ  /%N%A  EXPECTED:  %O3%A   ACTUAL:  %O3%A   XOR:  %O3/
012247    045 022516 052101 FMT4:   .ASCIZ  /%N%ATHE CONTENTS OF ALL%T%N%T/
012305    045 022516 030523 FMT4A:  .ASCIZ  /%N%S1%O3%S5%O3%S5%O3%S5%O3/
012340 047045 052045 000 FMT4B:  .ASCIZ  /%N%T/
012345    045 022516 032523 FMT4C:  .ASCIZ  /%N%S%O3%S5%O3%S5%O3%S5%O3/
012400 047045 040445 020040 FMT5:   .ASCIZ  /%N%A  WHEN %O3%A LOADED INTO BSEL1/
012443    045 022516 020101 FMT5A:  .ASCIZ  /%N%A  ATTEMPTING "M-LOOP" FUNCTION CODE %O2%A (%T%A)/
012530 047045 040445 042115 FMT7:   .ASCIZ  /%N%ADIAG #%O3%A FAILED/

012560 047045 040445 020040 FMT10:  .ASCIZ  /%N%A  EXPECTED:%O8%A  ACTUAL:%O8%A  XOR:%O8/
012634 040445 020040 051514 FMT10A: .ASCIZ  /%A  LSI ADDR:%O8/
012655    045 022516 034117 FMT11:  .ASCIZ  /%N%O8%O8%O8%O8/
012674 047045 047045 052045 FMT12:  .ASCIZ  /%N%N%T/
012703    045 022516 022524 FMT13:  .ASCIZ  /%N%T%O3%S2%O3%S2%O3%S2%O3%S2%O3%S2%O3/
012751    045 031123 047445 FMT14:  .ASCIZ  /%S2%O3%S2%O3/
012766 040445 020040 042504 FMT15:  .ASCIZ  /%A  DETECTED IN %T%T%A --/
013020 040445 020040 042504 FMT15A: .ASCIZ  /%A  DETECTED 8 TEST PATTERN ELEMENT # %D2/
013072 047045 052045 047445 FMT16:  .ASCIZ  /%N%T%O3%S4%O3%S%O3/
013115    045 022516 022524 FMT16A: .ASCIZ  /%N%T%O3%S%O0%S%O3%S4%O3%S%O3%S%O3/
013157    045 020101 020040 FMT17:  .ASCIZ  /%A     VALUE SENT TO NPR CONTROL REGISTER:  %O3/
013236 047045 040445 020040 FMT17A: .ASCIZ  /%N%A     VALUE READ FROM CONTROL REGISTER:    %O3/
013317    045 022516 020101 FMT17B: .ASCIZ  /%N%A     LSI-11 MEMORY ADDRESS ACCESSED:%O8/
013372 047045 040445 020040 FMT17C: .ASCIZ  /%N%A  INFORMATION ON THE FIRST OF %D5%A ERRORS:/

013452 047045 040445 042524 FMT19:  .ASCIZ  /%N%ATEST %D2%A NOT RUN%N/
013503    045 022524 053117 FMT21:  .ASCIZ  /%T%O6%N/
013513    045 022516 043101 FMT22:  .ASCIZ  /%N%AFAILING REG: /
013535    045 042501 050130 FMT23:  .ASCIZ  /%AEXPECTED: %O3%S5%AACTUAL: %O3%S5%AXOR: %O3%N/
013614 047045 052045 047045 FMT24:  .ASCIZ  /%N%T%N%T%N/
013627    045 031517 051445 FMT25:  .ASCIZ  /%O3%S5%O3%S5%O3%S5%O3%N/
013657    045 032123 047445 FMT26:  .ASCIZ  /%S4%O3%S5%O3%S5%O3%S5%O3%N/
013712 052045 052045 047045 FMT27:  .ASCIZ  /%T%T%N/
013721    045 042501 052130 FMT28:  .ASCIZ  /%AEXTENDED REG AX%01%A-%T%N/
013755    045 022524 000116 FMT29:  .ASCIZ  /%T%N/
013762 047045 040445 047506 FMT30:  .ASCIZ  /%N%AFOR BAUD RATE SPECIFIED./
014017    045 022516 044501 FMT31:  .ASCIZ  /%N%AIMPROPER CONNECTOR TYPE SPECIFIED/
014065    045 022516 043101 FMT32:  .ASCIZ  /%N%AFOR OPTION SPECIFIED./
014117    045 022516 052101 FMT39:  .ASCIZ  /%N%ATEST %D2%A NOT RUN%N/
014150 047045 040445 040506 FMT40:  .ASCIZ  /%N%AFAILING RAM ADRS: %O6%A (OCT)%N/

014214 051525 051131 020124 EM2:    .ASCIZ  /USYRT NOT INITIALIZED BY PROGRAM RESET/
014263    115 041511 047522 EM3:    .ASCIZ  /MICRO-DIAG. FAILURE/
014307    115 042122 020131 EM4:    .ASCIZ  /MRDY TIMEOUT/
014324 047522 020122 047516 EM14:   .ASCIZ  /ROR NOT SET/
```

```
014340  047522  020122  047516  EM16:   .ASCIZ  /ROR NOT CLEARED/
014360  042522  042101  053457  EM25:   .ASCIZ  'READ/WRITE DATA ERROR'
014406  051522  046517  047040  EM28:   .ASCIZ  /RSOM NOT CLEARED/
014427     122  047523  020115  EM29:   .ASCIZ  /RSOM NOT SET/
014444  042522  046517  047040  EM30:   .ASCIZ  /REOM NOT CLEARED/
014465     122  047505  020115  EM31:   .ASCIZ  /REOM NOT SET/
014502  041522  023526  020104  EM34:   .ASCIZ  /RCV'D DATA MISCOMPARE/
014530  042522  051122  047040  EM35:   .ASCIZ  /REMR NOT CLEARED/
014551     122  051105  020122  EM36:   .ASCIZ  /REMR NOT SET/
014566  040522  043502  020101  EM39:   .ASCIZ  /RABGA NOT CLEARED/
014610  040522  043502  020101  EM40:   .ASCIZ  /RABGA NOT SET/
014626  054124  052440  042116  EM54:   .ASCIZ  /TX UNDERRUN ERROR/
014650  051525  051131  020124  EM68:   .ASCIZ  /USYRT STATUS INCORRECT/
014677     124  040530  052103  EM69:   .ASCIZ  /TXACT NOT SET/
014715     124  040530  052103  EM70:   .ASCIZ  /TXACT NOT CLEARED/
014737     122  040530  052103  EM71:   .ASCIZ  /RXACT NOT SET/
014755     122  040530  052103  EM72:   .ASCIZ  /RXACT NOT CLEARED/
014777     124  046502  020124  EM73:   .ASCIZ  /TBMT NOT SET/
015014  041124  052115  047040  EM74:   .ASCIZ  /TBMT NOT CLEARED/
015035     122  040504  047040  EM75:   .ASCIZ  /RDA NOT SET/
015051     122  040504  047040  EM76:   .ASCIZ  /RDA NOT CLEARED/
015071     122  040523  047040  EM77:   .ASCIZ  /RSA NOT SET/
015105     122  040523  047040  EM78:   .ASCIZ  /RSA NOT CLEARED/
015125     122  046501  042440  EM79:   .ASCIZ  /RAM ERROR LOADING MICROCODE/
015161     103  051101  044522  EM80:   .ASCIZ  /CARRIER NOT SET/
015201     103  051101  044522  EM81:   .ASCIZ  /CARRIER NOT CLEARED/
015225     111  053116  046101  EM82:   .ASCIZ  /INVALID ERROR CODE FROM 6502/
015262  047515  042504  020115  EM83:   .ASCIZ  /MODEM STATUS INCORRECT/
015311     103  051524  047040  EM84:   .ASCIZ  /CTS NOT CLRD/
015326  052103  020123  047516  EM85:   .ASCIZ  /CTS NOT SET/
015342  040503  051122  042511  EM86:   .ASCIZ  /CARRIER NOT CLRD/
015363     103  051101  044522  EM87:   .ASCIZ  /CARRIER NOT SET/
015403     115  042117  046505  EM88:   .ASCIZ  /MODEM RDY NOT CLRD/
015426  047515  042504  020115  EM89:   .ASCIZ  /MODEM RDY NOT SET/
015450  042522  042503  053111  EM90:   .ASCIZ  /RECEIVER OVERRUN NOT SET/
015501     122  041505  044505  EM91:   .ASCIZ  /RECEIVER OVERRUN NOT CLEARED/
015536  051524  020117  044502  EM100:  .ASCIZ  /TSO BIT NOT SET/
015536  051524  020117  044502  EM101:  .ASCIZ  /TSO BIT NOT CLEARED/

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

015602  051502  046105  020060  TXT1:   .ASCIZ  /BSEL0   BSEL1   BSEL2   BSEL3/
015640  020040  020040  051502  TXT2:   .ASCIZ  /    BSEL4   BSEL5   BSEL6   BSEL7/
015702  051502  046105  030061  TXT2A:  .ASCIZ  /BSEL10  BSEL11  BSEL12  BSEL13/
015741     040  020040  041040  TXT2B:  .ASCIZ  /    BSEL14  BSEL15  BSEL16  BSEL17/
016004  041040  052131  020105  TXT3:   .ASCIZ  / BYTE SELECT REG'S ARE:/
016034  020040  051440  046105  TXT4:   .ASCIZ  /   SEL0    SEL2    SEL4    SEL6/
016074  020040  051440  046105  TXT4A:  .ASCIZ  /   SEL10   SEL12   SEL14   SEL16/
016135     102     000          TXT5:   .ASCIZ  /B/
016137     040  042523  042514  TXT6:   .ASCIZ  / SELECT REG'S ARE:/
016162  051040  043505  051511  TXT7:   .ASCIZ  / REGISTERS     ORB  ORA  DDRB DDRA T1CL T1CH T1LL T1LH /
016252  020040  020040  020040  TXT7A:  .ASCIZ  /                T2CL T2CH SR   ACR  PCR  IFR  IER  ORA  /
```

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                        ....TEXT STRINGS FOR ERROR HANDLERS -- "TXT___"

016342  042440  050130  041505  TXT8:   .ASCIZ  / EXPECTED:     /
016362  040440  052103  040525  TXT9:   .ASCIZ  / ACTUAL:       /
016402  054040  051117  020072  TXT10:  .ASCIZ  / XOR:          /
016422  020040  020116  050040  TXT11:  .ASCIZ  /  N  P  R     R  E  G  I  S  T  E  R  S:/
016474  020040  020040  020040  TXT11A: .ASCIZ  /                CONTROL  D A T A/
016532  020040  020040  020040  TXT11B: .ASCIZ  /                   OUT ADDR.     IN ADDR./
016602  042504  044526  042503  TXT12:  .ASCIZ  /DEVICE CSR ADDRESS : /
016630  051525  051131  020124  TXT13:  .ASCIZ  /USYRT REGS :/
016645     122  051504  046122  TXT14:  .ASCIZ  /RDSRL   RDSRH   TDSRL   TDSRH/
016703     040  020040  050040  TXT15:  .ASCIZ  /    PCSARL  PCSARH  PCR     USTAT/
016745     126  040511  051040  TXT16:  .ASCIZ  /VIA REGS :/
016760  051117  020102  020040  TXT17:  .ASCIZ  /ORB     ORA     DDRB    DDRA/
017015     040  020040  052040  TXT18:  .ASCIZ  /    T1CL    T1CH    T1LL    T1LH/
017056  031124  046103  020040  TXT19:  .ASCIZ  /T2CL    T2CH    SR      ACR/
017112  020040  020040  041520  TXT20:  .ASCIZ  /    PCR     IFR     IER     ORA/

017152     021     000          TXTNUL: .BYTE   21.0                    ;CTL-Q -- THIS (WE HOPE) IS HARMLESS

017154  047516  000120          TXTML0: .ASCIZ  /NOP/
017160  042522  042101  030440  TXTML1: .ASCIZ  /READ 1 BYTE/
017174  051127  052111  020105  TXTML2: .ASCIZ  /WRITE 1 BYTE/
017211     116  051120  047455  TXTML3: .ASCIZ  /NPR-OUT 256 BYTES/
017233     116  051120  044455  TXTML4: .ASCIZ  /NPR-IN 256 BYTES/
017254  042523  020124  044515  TXTML5: .ASCIZ  /SET MICROPROCESSOR'S PC/
017304  047125  042504  044506  TXTML6: .ASCIZ  /UNDEFINED/
017316  046101  047514  020127  TXTML7: .ASCIZ  /ALLOW U-PROCESSOR INTERRUPTS/

017353     126  040511  051040  TXTVR:  .ASCIZ  /VIA REGISTER /
017371     117  041122     000  TXTVR0: .ASCIZ  /ORB/
017375     117  040522     000  TXTVR1: .ASCIZ  /ORA/
017401     104  051104  000102  TXTVR2: .ASCIZ  /DDRB/
017406  042104  040522     000  TXTVR3: .ASCIZ  /DDRA/
017413     124  041461  000114  TXTVR4: .ASCIZ  /T1CL/
017420  030524  044103     000  TXTVR5: .ASCIZ  /T1CH/
017425     124  046061  000114  TXTVR6: .ASCIZ  /T1LL/
017432  030524  044114     000  TXTVR7: .ASCIZ  /T1LH/
017437     124  041462  000114  TXTVR8: .ASCIZ  /T2CL/
017444  031124  044103     000  TXTVR9: .ASCIZ  /T2CH/
017451     123  000122          TXTVRA: .ASCIZ  /SR/
017454  041501  000122          TXTVRB: .ASCIZ  /ACR/
017460  041520  000122          TXTVRC: .ASCIZ  /PCR/
017464  043111  000122          TXTVRD: .ASCIZ  /IFR/
017470  042511  000122          TXTVRE: .ASCIZ  /IER/
017474  051117  000101          TXTVRF: .ASCIZ  /ORA/

017500  050116  020122     000  TXTNP:  .ASCIZ  /NPR /
017505     103  047117  051124  TXTNP0: .ASCIZ  /CONTROL/
017515     104  052101  020101  TXTNP1: .ASCIZ  /DATA HI/
017525     104  052101  020101  TXTNP2: .ASCIZ  /DATA LO/
017535     101  042104  027122  TXTNP3: .ASCIZ  /ADDR. OUT EX/
017552  042101  051104  020056  TXTNP4: .ASCIZ  /ADDR. OUT HI/
017567     101  042104  027122  TXTNP5: .ASCIZ  /ADDR. OUT LO/
017604  042101  051104  020056  TXTNP6: .ASCIZ  /ADDR. IN EX/
017620  042101  051104  020056  TXTNP7: .ASCIZ  /ADDR. IN HI/
017634  042101  051104  020056  TXTNP8: .ASCIZ  /ADDR. IN LO/
```

```
                        ....TEXT STRINGS FOR ERROR HANDLERS -- "TXT___"

 017650  051525  051131  020124  TXTUR:  .ASCIZ  /USYRT REG /
 017663     122  051504  046122  TXTUR0: .ASCIZ  /RDSRL/
 017671     122  051504  044122  TXTUR1: .ASCIZ  /RDSRH/
 017677     124  051504  046122  TXTUR2: .ASCIZ  /TDSRL/
 017705     124  051504  044122  TXTUR3: .ASCIZ  /TDSRH/
 017713     120  051503  051101  TXTUR4: .ASCIZ  /PCSARL/
 017722  041520  040523  044122  TXTUR5: .ASCIZ  /PCSARH/
 017731     120  051103     000  TXTUR6: .ASCIZ  /PCR/
 017735     125  052123  052101  TXTUR7: .ASCIZ  /USTAT/
                                 .LIST   BEX
 017744                          .EVEN


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

 017744  017154  017160  017174  TXTMLT: .WORD   TXTML0,TXTML1,TXTML2,TXTML3,TXTML4,TXTML5,TXTML6,TXTML7
 017752  017211  017233  017254
 017760  017304  017316

 017764  017353                          .WORD   TXTVR
 017766  017371  017375  017401  TXTVRT: .WORD   TXTVR0,TXTVR1,TXTVR2,TXTVR3,TXTVR4,TXTVR5,TXTVR6,TXTVR7
 017774  017406  017413  017420
 020002  017425  017432
 020006  017437  017444  017451          .WORD   TXTVR8,TXTVR9,TXTVRA,TXTVRB,TXTVRC,TXTVRD,TXTVRE,TXTVRF
 020014  017454  017460  017464
 020022  017470  017474

 020026  017500                          .WORD   TXTNP
 020030  017505  017515  017525  TXTNPT: .WORD   TXTNP0,TXTNP1,TXTNP2,TXTNP3,TXTNP4,TXTNP5,TXTNP6,TXTNP7,TXTNP8
 020036  017535  017552  017567
 020044  017604  017620  017634
 020052  017663  017671  017677  TXTURT: .WORD   TXTUR0,TXTUR1,TXTUR2,TXTUR3,TXTUR4,TXTUR5,TXTUR6,TXTUR7
 020060  017705  017713  017722
 020066  017731  017735
```

```
                        ;-------------------------------------------------------------------------------
                        .SBTTL ....ERROR HANDLER -- ERR3 -- DUMP THE BYTE SELECT REGISTERS
                        ;-------------------------------------------------------------------------------
                                BGNMSG  ERR3
                                                                                ERR3::
020072  004737  021306            JSR     PC,ERR4$
020076                            PRINTB  #ENDEMB
020076  012746  012116                                                            MOV     #ENDEMB,-(SP)
020102  012746  000001                                                            MOV     #1,-(SP)
020106  010600                                                                    MOV     SP,R0
020110  104414                                                                    TRAP    C$PNTB
020112  062706  000004                                                            ADD     #4,SP
020116                            ENDMSG
                                                                                L10002:
020116  104423                                                                    TRAP    C$MSG
                        ;-------------------------------------------------------------------------------
                        .SBTTL ....ERROR HANDLER -- ERR4 -- M-LOOP TIMEOUT ERROR HANDLING
                        ;-------------------------------------------------------------------------------
                                BGNMSG  ERR4
                                                                                ERR4::
020120  105037  002325            CLRB    GDATA+1                 ;MAKE SURE BIT 8 DOESN'T PRINT!
020124  010146                    MOV     R1,-(SP)                ;SAVE THE WORKING REGISTER
020126  013701  002324            MOV     GDATA,R1                ;SAVE THIS FOR LATER
020132  022701  000017            CMP     #17,R1                  ;WAS THIS AN M-LOOP REQUEST?
020136  002012                    BGE     5$                      ;YES, THEN REPORT THE FUNCTION CODE
020140                            PRINTX  #FMT5,R1                ;NO,  THEN IT MUST BE A BSEL1 SETTING
020140  010146                                                                    MOV     R1,-(SP)
020142  012746  012400                                                            MOV     #FMT5,-(SP)
020146  012746  000002                                                            MOV     #2,-(SP)
020152  010600                                                                    MOV     SP,R0
020154  104415                                                                    TRAP    C$PNTX
020156  062706  000006                                                            ADD     #6,SP
020162  000424                    BR      20$
020164  001001          5$:       BNE     6$                      ;IF IT WAS A 17, THIS IS A "NOP" AND
020166  005001                    CLR     R1                      ;  THE TEXT POINTER MUST SO REFLECT.
020170  022701  000007    6$:     CMP     #7,R1                   ;IS FUNCTION CODE > 7?
020174  002002                    BGE     7$                      ;NO,  THEN WE CAN HANDLE IT
020176  012701  000006            MOV     #6,R1                   ;YES, THEN IT'S UNDEFINED -- SAY SO
020202  006301          7$:       ASL     R1                      ;CONVERT TO A WORD OFFSET
020204                            PRINTX  #FMT5A,GDATA,TXTMLT(R1) ;REPORT THE FAILING FUNCTION
020204  016146  017744                                                            MOV     TXTMLT(R1),-(SP)
020210  013746  002324                                                            MOV     GDATA,-(SP)
020214  012746  012443                                                            MOV     #FMT5A,-(SP)
020220  012746  000003                                                            MOV     #3,-(SP)
020224  010600                                                                    MOV     SP,R0
020226  104415                                                                    TRAP    C$PNTX
020230  062706  000010                                                            ADD     #10,SP
020234  012601          20$:      MOV     (SP)+,R1                ;RESTORE THE WORKING REGISTER
020236  004737  021634            JSR     PC,ERR5$                ;DUMP THE SELECT REGISTERS
020242                            ENDMSG
                                                                                L10003:
020242  104423                                                                    TRAP    C$MSG
                        ;-------------------------------------------------------------------------------
                        .SBTTL ....ERROR HANDLER -- ERR7A -- USYRT REGISTER ERRORS
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3903
3904  020244                        ;-------------------------------------------------------------------------
3905  020244                              BGNMSG  ERR7A
3906  020244  113701  002336                                                ERR7A::
3907  020250  006301                     MOVB    REGNUM,R1
3908  020252                            ASL     R1              ;AS PASSED, THIS WAS A BYTE OFFSET
3909  020252  016146  020052            PRINTB  #FMT15,#TXTUR,TXTURT(R1)
3910  020256  012746  017650                                                MOV     TXTURT(R1),-(SP)
3911  020262  012746  012766                                                MOV     #TXTUR,-(SP)
3912  020266  012746  000003                                                MOV     #FMT15,-(SP)
3913  020272  010600                                                        MOV     #3,-(SP)
3914  020274  104414                                                        MOV     SP,R0
3915  020276  062706  000010                                                TRAP    C$PNTB
3916  020302  004737  021262                                                ADD     #10,SP
3917  020306                            JSR     PC,XORGB
3918  020306  013746  002330            PRINTB  #FMT3,GDATA,BDATA,XDATA
3919  020312  013746  002326                                                MOV     XDATA,-(SP)
3920  020316  013746  002324                                                MOV     BDATA,-(SP)
3921  020322  012746  012163                                                MOV     GDATA,-(SP)
3922  020326  012746  000004                                                MOV     #FMT3,-(SP)
3923  020332  010600                                                        MOV     #4,-(SP)
3924  020334  104414                                                        MOV     SP,R0
3925  020336  062706  000012                                                TRAP    C$PNTB
3926  020342                                                                ADD     #12,SP
3927  020342  012746  012116            PRINTB  #ENDEMB
3928  020346  012746  000001                                                MOV     #ENDEMB,-(SP)
3929  020352  010600                                                        MOV     #1,-(SP)
3930  020354  104414                                                        MOV     SP,R0
3931  020356  062706  000004                                                TRAP    C$PNTB
3932  020362                                                                ADD     #4,SP
3933  020362                            ENDMSG
3934  020362  104423                                                  L10004:
3935                                                                        TRAP    C$MSG
3936                                    ;-------------------------------------------------------------------------
3937                                    .SBTTL ....ERROR HANDLER -- ERR10 -- USYRT REG ERROR (XOR, REG PRINTOUT)
3938                                    ;-------------------------------------------------------------------------
3939  020364                                BGNMSG  ERR10
3940  020364                                                                ERR10::
3941  020364                            PRINTB  #FMT21,#TXT12,MPCSR
3942  020364  013746  002416                                                MOV     MPCSR,-(SP)
3943  020370  012746  016602                                                MOV     #TXT12,-(SP)
3944  020374  012746  013503                                                MOV     #FMT21,-(SP)
3945  020400  012746  000003                                                MOV     #3,-(SP)
3946  020404  010600                                                        MOV     SP,R0
3947  020406  104414                                                        TRAP    C$PNTB
3948  020410  062706  000010                                                ADD     #10,SP
3949  020414                            PRINTB  #FMT22
3950  020414  012746  013513                                                MOV     #FMT22,-(SP)
3951  020420  012746  000001                                                MOV     #1,-(SP)
3952  020424  010600                                                        MOV     SP,R0
3953  020426  104414                                                        TRAP    C$PNTB
3954  020430  062706  000004                                                ADD     #4,SP
3955  020434  013701  002336            MOV     REGNUM,R1
3956  020440  006301                    ASL     R1              ;GET PTR TO USYRT REG ASCII
3957  020442                            PRINTB  #FMT27,#TXTUR,TXTURT(R1)
3958  020442  016146  020052                                                MOV     TXTURT(R1),-(SP)
```

```
3959  020446  012746  017650                                                  MOV     #TXTUR,-(SP)
3960  020452  012746  013712                                                  MOV     #FMT27,-(SP)
3961  020456  012746  000003                                                  MOV     #3,-(SP)
3962  020462  010600                                                          MOV     SP,R0
3963  020464  104414                                                          TRAP    C$PNTB
3964  020466  062706  000010                                                  ADD     #10,SP
3965  020472  004737  021262          JSR     PC,XORGB                ;COMPUTE XOR OF GOOD AND BAD DATA
3966  020476                         PRINTB  #FMT23,GDATA,BDATA,XDATA
3967  020476  013746  002330                                                  MOV     XDATA,-(SP)
3968  020502  013746  002326                                                  MOV     BDATA,-(SP)
3969  020506  013746  002324                                                  MOV     GDATA,-(SP)
3970  020512  012746  013535                                                  MOV     #FMT23,-(SP)
3971  020516  012746  000004                                                  MOV     #4,-(SP)
3972  020522  010600                                                          MOV     SP,R0
3973  020524  104414                                                          TRAP    C$PNTB
3974  020526  062706  000012                                                  ADD     #12,SP
3975  020532  004737  022364          JSR     PC,ERR12$               ;GET & PRINT USYRT REGISTERS
3976  020536                         ENDMSG
3977  020536                                                          L10005:
3978  020536  104423                                                          TRAP    C$MSG
3979
3980                                 ;-------------------------------------------------------------------------------
3981                                 .SBTTL ....ERROR HANDLER -- ERR11 -- VIA REG ERROR (XOR, REG PRINTOUT)
3982                                 ;-------------------------------------------------------------------------------
3983
3984  020540                         BGNMSG  ERR11
3985  020540                                                          ERR11::
3986  020540                         PRINTB  #FMT21,#TXT12,MPCSR
3987  020540  013746  002416                                                  MOV     MPCSR,-(SP)
3988  020544  012746  016602                                                  MOV     #TXT12,-(SP)
3989  020550  012746  013503                                                  MOV     #FMT21,-(SP)
3990  020554  012746  000003                                                  MOV     #3,-(SP)
3991  020560  010600                                                          MOV     SP,R0
3992  020562  104414                                                          TRAP    C$PNTB
3993  020564  062706  000010                                                  ADD     #10,SP
3994  020570                         PRINTB  #FMT22
3995  020570  012746  013513                                                  MOV     #FMT22,-(SP)
3996  020574  012746  000001                                                  MOV     #1,-(SP)
3997  020600  010600                                                          MOV     SP,R0
3998  020602  104414                                                          TRAP    C$PNTB
3999  020604  062706  000004                                                  ADD     #4,SP
4000  020610  013701  002336          MOV     REGNUM,R1
4001  020614  006301                  ASL     R1                      ;GET PTR TO VIA REG ASCII
4002  020616                         PRINTB  #FMT27,#TXTVR,TXTVRT(R1)
4003  020616  016146  017766                                                  MOV     TXTVRT(R1),-(SP)
4004  020622  012746  017353                                                  MOV     #TXTVR,-(SP)
4005  020626  012746  013712                                                  MOV     #FMT27,-(SP)
4006  020632  012746  000003                                                  MOV     #3,-(SP)
4007  020636  010600                                                          MOV     SP,R0
4008  020640  104414                                                          TRAP    C$PNTB
4009  020642  062706  000010                                                  ADD     #10,SP
4010  020646  004737  021262          JSR     PC,XORGB                ;COMPUTE XOR OF GOOD AND BAD DATA
4011  020652                         PRINTB  #FMT23,GDATA,BDATA,XDATA
4012  020652  013746  002330                                                  MOV     XDATA,-(SP)
4013  020656  013746  002326                                                  MOV     BDATA,-(SP)
4014  020662  013746  002324                                                  MOV     GDATA,-(SP)
```

```
                        ....ERROR HANDLER -- ERR11 -- VIA REG ERROR (XOR, REG PRINTOUT)

4015  020666  012746  013535                                                    MOV     #FMT23,-(SP)
4016  020672  012746  000004                                                    MOV     #4,-(SP)
4017  020676  010600                                                           MOV     SP,R0
4018  020700  104414                                                           TRAP    C$PNTB
4019  020702  062706  000012                                                   ADD     #12,SP
4020  020706  004737  022032          JSR     PC,ERR11$               ;GET & PRINT VIA REGISTERS
4021  020712                          ENDMSG
4022  020712                                                          L10006:
4023  020712  104423                                                           TRAP    C$MSG
4024
4025
4026                          ;-------------------------------------------------------------------------
4027                          .SBTTL ....ERROR HANDLER -- ERR12 -- USYRT REG ERROR (USYRT PRINTOUT)
4028                          ;-------------------------------------------------------------------------
4029  020714                          BGNMSG  ERR12
4030  020714                                                          ERR12::
4031  020714                          PRINTB  #FMT21,#TXT12,MPCSR
4032  020714  013746  002416                                                    MOV     MPCSR,-(SP)
4033  020720  012746  016602                                                    MOV     #TXT12,-(SP)
4034  020724  012746  013503                                                    MOV     #FMT21,-(SP)
4035  020730  012746  000003                                                    MOV     #3,-(SP)
4036  020734  010600                                                           MOV     SP,R0
4037  020736  104414                                                           TRAP    C$PNTB
4038  020740  062706  000010                                                   ADD     #10,SP
4039  020744                          PRINTB  #FMT22
4040  020744  012746  013513                                                    MOV     #FMT22,-(SP)
4041  020750  012746  000001                                                    MOV     #1,-(SP)
4042  020754  010600                                                           MOV     SP,R0
4043  020756  104414                                                           TRAP    C$PNTB
4044  020760  062706  000004                                                   ADD     #4,SP
4045  020764  013701  002336          MOV     REGNUM,R1
4046  020770  006301                  ASL     R1                      ;GET PTR TO USYRT REG ASCII
4047  020772                          PRINTB  #FMT27,#TXTUR,TXTURT(R1)
4048  020772  016146  020052                                                    MOV     TXTURT(R1),-(SP)
4049  020776  012746  017650                                                    MOV     #TXTUR,-(SP)
4050  021002  012746  013712                                                    MOV     #FMT27,-(SP)
4051  021006  012746  000003                                                    MOV     #3,-(SP)
4052  021012  010600                                                           MOV     SP,R0
4053  021014  104414                                                           TRAP    C$PNTB
4054  021016  062706  000010                                                   ADD     #10,SP
4055  021022  004737  022364          JSR     PC,ERR12$               ;GET & PRINT USYRT REGISTERS
4056  021026                          ENDMSG
4057  021026                                                          L10007:
4058  021026  104423                                                           TRAP    C$MSG
4059
4060
4061                          ;-------------------------------------------------------------------------
4062                          .SBTTL ....ERROR HANDLER -- ERR13 -- RAM ADDRESS ERRORS
4063                          ;-------------------------------------------------------------------------
4064  021030                          BGNMSG  ERR13
4065  021030                                                          ERR13::
4066  021030                          PRINTB  #FMT21,#TXT12,MPCSR
4067  021030  013746  002416                                                    MOV     MPCSR,-(SP)
4068  021034  012746  016602                                                    MOV     #TXT12,-(SP)
4069  021040  012746  013503                                                    MOV     #FMT21,-(SP)
4070  021044  012746  000003                                                    MOV     #3,-(SP)
```

```
4071  021050  010600                                                    MOV     SP,R0
4072  021052  104414                                                    TRAP    C$PNTB
4073  021054  062706  000010                                            ADD     #10,SP
4074  021060                        PRINTB  #FMT40,REGNUM
4075  021060  013746  002336                                            MOV     REGNUM,-(SP)
4076  021064  012746  014150                                            MOV     #FMT40,-(SP)
4077  021070  012746  000002                                            MOV     #2,-(SP)
4078  021074  010600                                                    MOV     SP,R0
4079  021076  104414                                                    TRAP    C$PNTB
4080  021100  062706  000006                                            ADD     #6,SP
4081  021104  004737  021262        JSR     PC,XORGB        ;COMPUTE XOR OF GOOD AND BAD DATA
4082  021110                        PRINTB  #FMT23,GDATA,BDATA,XDATA
4083  021110  013746  002330                                            MOV     XDATA,-(SP)
4084  021114  013746  002326                                            MOV     BDATA,-(SP)
4085  021120  013746  002324                                            MOV     GDATA,-(SP)
4086  021124  012746  013535                                            MOV     #FMT23,-(SP)
4087  021130  012746  000004                                            MOV     #4,-(SP)
4088  021134  010600                                                    MOV     SP,R0
4089  021136  104414                                                    TRAP    C$PNTB
4090  021140  062706  000012                                            ADD     #12,SP
4091  021144                        ENDMSG
4092  021144                                                  L10010:
4093  021144  104423                                                    TRAP    C$MSG
4094
4095
4096                          ;-------------------------------------------------------------------------
4097                          .SBTTL ....ERROR HANDLER -- ERR14 -- VIA REG ERRORS (VIA PRINTOUT)
4098                          ;-------------------------------------------------------------------------
4099  021146                  BGNMSG  ERR14
4100  021146                                                  ERR14::
4101  021146                  PRINTB  #FMT21,#TXT12,MPCSR
4102  021146  013746  002416                                            MOV     MPCSR,-(SP)
4103  021152  012746  016602                                            MOV     #TXT12,-(SP)
4104  021156  012746  013503                                            MOV     #FMT21,-(SP)
4105  021162  012746  000003                                            MOV     #3,-(SP)
4106  021166  010600                                                    MOV     SP,R0
4107  021170  104414                                                    TRAP    C$PNTB
4108  021172  062706  000010                                            ADD     #10,SP
4109  021176                  PRINTB  #FMT22
4110  021176  012746  013513                                            MOV     #FMT22,-(SP)
4111  021202  012746  000001                                            MOV     #1,-(SP)
4112  021206  010600                                                    MOV     SP,R0
4113  021210  104414                                                    TRAP    C$PNTB
4114  021212  062706  000004                                            ADD     #4,SP
4115  021216  013701  002336        MOV     REGNUM,R1
4116  021222  006301                ASL     R1                      ;GET PTR TO VIA REG ASCII
4117  021224                        PRINTB  #FMT27,#TXTVR,TXTVRT(R1)
4118  021224  016146  017766                                            MOV     TXTVRT(R1),-(SP)
4119  021230  012746  017353                                            MOV     #TXTVR,-(SP)
4120  021234  012746  013712                                            MOV     #FMT27,-(SP)
4121  021240  012746  000003                                            MOV     #3,-(SP)
4122  021244  010600                                                    MOV     SP,R0
4123  021246  104414                                                    TRAP    C$PNTB
4124  021250  062706  000010                                            ADD     #10,SP
4125  021254  004737  022032        JSR     PC,ERR11$               ;GET & PRINT VIA REGISTERS
4126  021260                        ENDMSG
```

```
4127  021260                                                                  L10011:
4128  021260  104423                                                                TRAP    C$MSG
4129
4130
4131
4132
4133
4134                          .SBTTL ....ERROR HANDLER SUBROUTINES
4135                          ;-------------------------------------------------------------------------
4136                          ;------------ SUBROUTINES USED ONLY BY ERROR HANDLERS ---------------------
4137                          ;-------------------------------------------------------------------------
4138
4139                          .SBTTL ........ERROR HANDLER SUBROUTINE -- XORGB
4140
4141                          ;       PERFORM EXCLUSIVE OR BETWEEN "GDATA" & "BDATA" PUTTING
4142                          ;       THE RESULT IN "XDATA"
4143
4144  021262  010146          XORGB:  MOV     R1,-(SP)        ;PRESERVE WORKING REGISTER
4145  021264  013701  002324          MOV     GDATA,R1        ;GET "GOOD" DATA
4146  021270  013737  002326  002330  MOV     BDATA,XDATA     ;AND "BAD" DATA
4147  021276  074137  002330          XOR     R1,XDATA        ;PERFORM EXCLUSIVE OR
4148  021302  012601                  MOV     (SP)+,R1        ;RESTORE R1
4149  021304  000207                  RTS     PC              ;RETURN
4150
4151                          ;-------------------------------------------------------------------------
4152                          .SBTTL ........ERROR HANDLER SUBROUTINE -- ERR4$
4153                          ;-------------------------------------------------------------------------
4154                          ;       IDENTIFY & DUMP THE BYTE SELECT REGISTERS
4155
4156  021306                  ERR4$:  PRINTX  #FMT4,#TXT3,#TXT1
4157  021306  012746  015602                                                  MOV     #TXT1,-(SP)
4158  021312  012746  016004                                                  MOV     #TXT3,-(SP)
4159  021316  012746  012247                                                  MOV     #FMT4,-(SP)
4160  021322  012746  000003                                                  MOV     #3,-(SP)
4161  021326  010600                                                          MOV     SP,R0
4162  021330  104415                                                          TRAP    C$PNTX
4163  021332  062706  000010                                                  ADD     #10,SP
4164  021336                          PRINTX  #FMT4A,BSR0,BSR1,BSR2,BSR3
4165  021336  013746  002210                                                  MOV     BSR3,-(SP)
4166  021342  013746  002206                                                  MOV     BSR2,-(SP)
4167  021346  013746  002204                                                  MOV     BSR1,-(SP)
4168  021352  013746  002202                                                  MOV     BSR0,-(SP)
4169  021356  012746  012305                                                  MOV     #FMT4A,-(SP)
4170  021362  012746  000005                                                  MOV     #5,-(SP)
4171  021366  010600                                                          MOV     SP,R0
4172  021370  104415                                                          TRAP    C$PNTX
4173  021372  062706  000014                                                  ADD     #14,SP
4174  021376                          PRINTX  #FMT4B,#TXT2
4175  021376  012746  015640                                                  MOV     #TXT2,-(SP)
4176  021402  012746  012340                                                  MOV     #FMT4B,-(SP)
4177  021406  012746  000002                                                  MOV     #2,-(SP)
4178  021412  010600                                                          MOV     SP,R0
4179  021414  104415                                                          TRAP    C$PNTX
4180  021416  062706  000006                                                  ADD     #6,SP
4181  021422                          PRINTX  #FMT4C,BSR4,BSR5,BSR6,BSR7
4182  021422  013746  002220                                                  MOV     BSR7,-(SP)
```

```
 4183  021426  013746  002216                                                  MOV     BSR6,-(SP)
 4184  021432  013746  002214                                                  MOV     BSR5,-(SP)
 4185  021436  013746  002212                                                  MOV     BSR4,-(SP)
 4186  021442  012746  012345                                                  MOV     #FMT4C,-(SP)
 4187  021446  012746  000005                                                  MOV     #5,-(SP)
 4188  021452  010600                                                          MOV     SP,R0
 4189  021454  104415                                                          TRAP    C$PNTX
 4190  021456  062706  000014                                                  ADD     #14,SP
 4191  021462                  PRINTX  #FMT4B,#TXT2A
 4192  021462  012746  015702                                                  MOV     #TXT2A,-(SP)
 4193  021466  012746  012340                                                  MOV     #FMT4B,-(SP)
 4194  021472  012746  000002                                                  MOV     #2,-(SP)
 4195  021476  010600                                                          MOV     SP,R0
 4196  021500  104415                                                          TRAP    C$PNTX
 4197  021502  062706  000006                                                  ADD     #6,SP
 4198  021506                  PRINTX  #FMT4A,BSR10,BSR11,BSR12,BSR13
 4199  021506  013746  002230                                                  MOV     BSR13,-(SP)
 4200  021512  013746  002226                                                  MOV     BSR12,-(SP)
 4201  021516  013746  002224                                                  MOV     BSR11,-(SP)
 4202  021522  013746  002222                                                  MOV     BSR10,-(SP)
 4203  021526  012746  012305                                                  MOV     #FMT4A,-(SP)
 4204  021532  012746  000005                                                  MOV     #5,-(SP)
 4205  021536  010600                                                          MOV     SP,R0
 4206  021540  104415                                                          TRAP    C$PNTX
 4207  021542  062706  000014                                                  ADD     #14,SP
 4208  021546                  PRINTX  #FMT4B,#TXT2B
 4209  021546  012746  015741                                                  MOV     #TXT2B,-(SP)
 4210  021552  012746  012340                                                  MOV     #FMT4B,-(SP)
 4211  021556  012746  000002                                                  MOV     #2,-(SP)
 4212  021562  010600                                                          MOV     SP,R0
 4213  021564  104415                                                          TRAP    C$PNTX
 4214  021566  062706  000006                                                  ADD     #6,SP
 4215  021572                  PRINTX  #FMT4C,BSR14,BSR15,BSR16,BSR17
 4216  021572  013746  002240                                                  MOV     BSR17,-(SP)
 4217  021576  013746  002236                                                  MOV     BSR16,-(SP)
 4218  021602  013746  002234                                                  MOV     BSR15,-(SP)
 4219  021606  013746  002232                                                  MOV     BSR14,-(SP)
 4220  021612  012746  012345                                                  MOV     #FMT4C,-(SP)
 4221  021616  012746  000005                                                  MOV     #5,-(SP)
 4222  021622  010600                                                          MOV     SP,R0
 4223  021624  104415                                                          TRAP    C$PNTX
 4224  021626  062706  000014                                                  ADD     #14,SP
 4225  021632  000207                  RTS     PC
 4226
 4227                  ;-------------------------------------------------------------------------
 4228                  .SBTTL .....ERROR HANDLER SUBROUTINE -- ERR5$
 4229                  ;-------------------------------------------------------------------------
 4230                  ;       COMMON ERROR SUBROUTINE TO PRINT SELECT REGISTERS
 4231  021634  ERR5$:
 4232  021634                  PRINTX  #FMT4,#TXT6,#TXT4
 4233  021634  012746  016034                                                  MOV     #TXT4,-(SP)
 4234  021640  012746  016137                                                  MOV     #TXT6,-(SP)
 4235  021644  012746  012247                                                  MOV     #FMT4,-(SP)
 4236  021650  012746  000003                                                  MOV     #3,-(SP)
 4237  021654  010600                                                          MOV     SP,R0
 4238  021656  104415                                                          TRAP    C$PNTX
```

```
4239  021660  062706  000010                                                    ADD     #10,SP
4240  021664                          PRINTX  #FMT11,WSR0,WSR2,WSR4,WSR6 ;DUMP THE SELECT REGISTERS
4241  021664  013746  002210                                                    MOV     WSR6,-(SP)
4242  021670  013746  002206                                                    MOV     WSR4,-(SP)
4243  021674  013746  002204                                                    MOV     WSR2,-(SP)
4244  021700  013746  002202                                                    MOV     WSR0,-(SP)
4245  021704  012746  012655                                                    MOV     #FMT11,-(SP)
4246  021710  012746  000005                                                    MOV     #5,-(SP)
4247  021714  010600                                                            MOV     SP,R0
4248  021716  104415                                                            TRAP    C$PNTX
4249  021720  062706  000014                                                    ADD     #14,SP
4250  021724                          PRINTX  #FMT4B,#TXT4A
4251  021724  012746  016074                                                    MOV     #TXT4A,-(SP)
4252  021730  012746  012340                                                    MOV     #FMT4B,-(SP)
4253  021734  012746  000002                                                    MOV     #2,-(SP)
4254  021740  010600                                                            MOV     SP,R0
4255  021742  104415                                                            TRAP    C$PNTX
4256  021744  062706  000006                                                    ADD     #6,SP
4257  021750                          PRINTX  #FMT11,WSR10,WSR12,WSR14,WSR16 ;DUMP THE SELECT REGISTERS
4258  021750  013746  002220                                                    MOV     WSR16,-(SP)
4259  021754  013746  002216                                                    MOV     WSR14,-(SP)
4260  021760  013746  002214                                                    MOV     WSR12,-(SP)
4261  021764  013746  002212                                                    MOV     WSR10,-(SP)
4262  021770  012746  012655                                                    MOV     #FMT11,-(SP)
4263  021774  012746  000005                                                    MOV     #5,-(SP)
4264  022000  010600                                                            MOV     SP,R0
4265  022002  104415                                                            TRAP    C$PNTX
4266  022004  062706  000014                                                    ADD     #14,SP
4267  022010                          PRINTB  #ENDEMB
4268  022010  012746  012116                                                    MOV     #ENDEMB,-(SP)
4269  022014  012746  000001                                                    MOV     #1,-(SP)
4270  022020  010600                                                            MOV     SP,R0
4271  022022  104414                                                            TRAP    C$PNTB
4272  022024  062706  000004                                                    ADD     #4,SP
4273  022030  000207                  RTS     PC
4274
4275                            ;-----------------------------------------------------------------------
4276                            .SBTTL .....ERROR HANDLER SUBROUTINE -- ERR11$
4277                            ;-----------------------------------------------------------------------
4278                            ;       COMMON ERROR SUBROUTINE TO GET/PRINT VIA REGISTERS
4279
4280  022032  004737  004460  ERR11$: JSR     PC,GETVRS               ;GET VIA REGS FOR PRINTOUT
4281  022036                          PRINTX  #FMT24,#TXT16,#TXT17
4282  022036  012746  016760                                                    MOV     #TXT17,-(SP)
4283  022042  012746  016745                                                    MOV     #TXT16,-(SP)
4284  022046  012746  013614                                                    MOV     #FMT24,-(SP)
4285  022052  012746  000003                                                    MOV     #3,-(SP)
4286  022056  010600                                                            MOV     SP,R0
4287  022060  104415                                                            TRAP    C$PNTX
4288  022062  062706  000010                                                    ADD     #10,SP
4289  022066                          PRINTX  #FMT25,VREGS+0,VREGS+2,VREGS+4,VREGS+6
4290  022066  013746  002270                                                    MOV     VREGS+6,-(SP)
4291  022072  013746  002266                                                    MOV     VREGS+4,-(SP)
4292  022076  013746  002264                                                    MOV     VREGS+2,-(SP)
4293  022102  013746  002262                                                    MOV     VREGS+0,-(SP)
4294  022106  012746  013627                                                    MOV     #FMT25,-(SP)
```

```
 4295  022112  012746  000005                                                  MOV     #5.-(SP)
 4296  022116  010600                                                          MOV     SP,R0
 4297  022120  104415                                                          TRAP    C$PNTX
 4298  022122  062706  000014                                                  ADD     #14.SP
 4299  022126
                                PRINTX  #FMT29  #TXT18
 4300  022126  012746  017015                                                  MOV     #TXT18.-(SP)
 4301  022132  012746  013755                                                  MOV     #FMT29,-(SP)
 4302  022136  012746  000002                                                  MOV     #2.-(SP)
 4303  022142  010600                                                          MOV     SP,R0
 4304  022144  104415                                                          TRAP    C$PNTX
 4305  022146  062706  000006                                                  ADD     #6.SP
 4306  022152
                                PRINTX  #FMT26,VREGS+8.,VREGS+10.,VREGS+12.,VREGS+14.
 4307  022152  013746  002300                                                  MOV     VREGS+14.,-(SP)
 4308  022156  013746  002276                                                  MOV     VREGS+12.,-(SP)
 4309  022162  013746  002274                                                  MOV     VREGS+10.,-(SP)
 4310  022166  013746  002272                                                  MOV     VREGS+8.,-(SP)
 4311  022172  012746  013657                                                  MOV     #FMT26,-(SP)
 4312  022176  012746  000005                                                  MOV     #5.-(SP)
 4313  022202  010600                                                          MOV     SP,R0
 4314  022204  104415                                                          TRAP    C$PNTX
 4315  022206  062706  000014                                                  ADD     #14.SP
 4316  022212
                                PRINTX  #FMT29,#TXT19
 4317  022212  012746  017056                                                  MOV     #TXT19.-(SP)
 4318  022216  012746  013755                                                  MOV     #FMT29,-(SP)
 4319  022222  012746  000002                                                  MOV     #2.-(SP)
 4320  022226  010600                                                          MOV     SP,R0
 4321  022230  104415                                                          TRAP    C$PNTX
 4322  022232  062706  000006                                                  ADD     #6.SP
 4323  022236
                                PRINTX  #FMT25,VREGS+16.,VREGS+18.,VREGS+20.,VREGS+22.
 4324  022236  013746  002310                                                  MOV     VREGS+22.,-(SP)
 4325  022242  013746  002306                                                  MOV     VREGS+20.,-(SP)
 4326  022246  013746  002304                                                  MOV     VREGS+18.,-(SP)
 4327  022252  013746  002302                                                  MOV     VREGS+16.,-(SP)
 4328  022256  012746  013627                                                  MOV     #FMT25,-(SP)
 4329  022262  012746  000005                                                  MOV     #5.-(SP)
 4330  022266  010600                                                          MOV     SP,R0
 4331  022270  104415                                                          TRAP    C$PNTX
 4332  022272  062706  000014                                                  ADD     #14.SP
 4333  022276
                                PRINTX  #FMT29,#TXT20
 4334  022276  012746  017112                                                  MOV     #TXT20.-(SP)
 4335  022302  012746  013755                                                  MOV     #FMT29,-(SP)
 4336  022306  012746  000002                                                  MOV     #2.-(SP)
 4337  022312  010600                                                          MOV     SP,R0
 4338  022314  104415                                                          TRAP    C$PNTX
 4339  022316  062706  000006                                                  ADD     #6.SP
 4340  022322
                                PRINTX  #FMT26,VREGS+24.,VREGS+26.,VREGS+28.,VREGS+30.
 4341  022322  013746  002320                                                  MOV     VREGS+30.,-(SP)
 4342  022326  013746  002316                                                  MOV     VREGS+28.,-(SP)
 4343  022332  013746  002314                                                  MOV     VREGS+26.,-(SP)
 4344  022336  013746  002312                                                  MOV     VREGS+24.,-(SP)
 4345  022342  012746  013657                                                  MOV     #FMT26,-(SP)
 4346  022346  012746  000005                                                  MOV     #5.-(SP)
 4347  022352  010600                                                          MOV     SP,R0
 4348  022354  104415                                                          TRAP    C$PNTX
 4349  022356  062706  000014                                                  ADD     #14.SP
 4350  022362  000207
                                RTS     PC
```

```
4351
4352                            ;-------------------------------------------------------------------------
4353                            .SBTTL .....ERROR HANDLER SUBROUTINE -- ERR12#
4354                            ;-------------------------------------------------------------------------
4355                            ;       COMMON ERROR ROUTINE TO GET AND PRINTOUT USYRT REGISTERS
4356
4357  022364  004737  004360  ERR12#: JSR     PC,GETURS               ;GET USYRT REGS FOR PRINTOUT
4358  022370                          PRINTX  #FMT24,#TXT13,#TXT14
4359  022370  012746  016645                                                  MOV     #TXT14,-(SP)
4360  022374  012746  016630                                                  MOV     #TXT13,-(SP)
4361  022400  012746  013614                                                  MOV     #FMT24,-(SP)
4362  022404  012746  000003                                                  MOV     #3,-(SP)
4363  022410  010600                                                          MOV     SP,R0
4364  022412  104415                                                          TRAP    C$PNTX
4365  022414  062706  000010                                                  ADD     #10,SP
4366  022420                          PRINTX  #FMT25,UREGS+0,UREGS+2,UREGS+4,UREGS+6
4367  022420  013746  002250                                                  MOV     UREGS+6,-(SP)
4368  022424  013746  002246                                                  MOV     UREGS+4,-(SP)
4369  022430  013746  002244                                                  MOV     UREGS+2,-(SP)
4370  022434  013746  002242                                                  MOV     UREGS+0,-(SP)
4371  022440  012746  013627                                                  MOV     #FMT25,-(SP)
4372  022444  012746  000005                                                  MOV     #5,-(SP)
4373  022450  010600                                                          MOV     SP,R0
4374  022452  104415                                                          TRAP    C$PNTX
4375  022454  062706  000014                                                  ADD     #14,SP
4376  022460                          PRINTX  #FMT29,#TXT15
4377  022460  012746  016703                                                  MOV     #TXT15,-(SP)
4378  022464  012746  013755                                                  MOV     #FMT29,-(SP)
4379  022470  012746  000002                                                  MOV     #2,-(SP)
4380  022474  010600                                                          MOV     SP,R0
4381  022476  104415                                                          TRAP    C$PNTX
4382  022500  062706  000006                                                  ADD     #6,SP
4383  022504                          PRINTX  #FMT26,UREGS+10,UREGS+12,UREGS+14,UREGS+16
4384  022504  013746  002260                                                  MOV     UREGS+16,-(SP)
4385  022510  013746  002256                                                  MOV     UREGS+14,-(SP)
4386  022514  013746  002254                                                  MOV     UREGS+12,-(SP)
4387  022520  013746  002252                                                  MOV     UREGS+10,-(SP)
4388  022524  012746  013657                                                  MOV     #FMT26,-(SP)
4389  022530  012746  000005                                                  MOV     #5,-(SP)
4390  022534  010600                                                          MOV     SP,R0
4391  022536  104415                                                          TRAP    C$PNTX
4392  022540  062706  000014                                                  ADD     #14,SP
4393  022544  000207                  RTS     PC
4394
4395                            .EVEN
```

```
                        .SBTTL  LOAD DEVICE PROTECTION TABLE

                        ;//////////////////////////////////////////////////////////////////////////////
                        ;/ THIS TABLE IDENTIFIES THE LOAD DEVICE TO THE SUPERVISOR, SO THAT IT CAN BE
                        ;/ PROTECTED FROM TESTING, IF DESIRED.
                        ;//////////////////////////////////////////////////////////////////////////////

022546                          BGNPROT
022546                                                          L$PROT::
022546  177777                  .WORD   -1      ;DON'T CHK CSR ADRS
022550  177777                  .WORD   -1      ;DON'T CHK MASSBUS UNIT NO.
022552  177777                  .WORD   -1      ;DON'T CHK DRIVE NO.
022554                          ENDPROT
```

```
                        .SBTTL  INITIALIZE SECTION

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

022554                          BGNINIT
022554                                                                  L$INIT::

022554  010637  002340          MOV     SP,PSTACK       ;SAVE BASE-LEVEL STACK POINTER
022560  005037  002344          CLR     SUBRPC          ;CLEAR SUBR CALL PC
022564  005037  002400          CLR     CHPTYP          ;CLEAR USYRT CHIP TYPE INDICATOR
022570  005037  002376          CLR     ERROR1          ;CLEAR ERROR FLAG
022574  005037  002402          CLR     SAVLEN          ;CLEAR CHAR LENGTH FROM SETUP
022600  005737  002370          TST     FRSTIM          ;SEE IF FIRST TIME THROUGH AFTER LOAD
022604  001007                  BNE     6$              ;BR IF NOT
022606  013737  000004  002372  MOV     @#4,SAVE4       ;SAVE ERROR TRAP VECTOR
022614  013737  000006  002374  MOV     @#6,SAVE6
022622  000406                  BR      9$

022624  013737  002372  000004  6$:     MOV     SAVE4,@#4       ;RESTORE ERROR TRAP VECTOR
022632  013737  002374  000006          MOV     SAVE6,@#6

022640  012737  000001  002370  9$:     MOV     #1,FRSTIM       ;MARK FLAG FOR NEXT TIME THROUGH

                        ;SEE IF PROGRAM JUST STARTED, BR IF YES
022646                          READEF  #EF.START
022646  012700  000040                                                  MOV     #EF.START,R0
022652  104447                                                          TRAP    C$REFG
022654                          BCOMPLETE       STARST
022654  103415                                                          BCS     STARST

                        ;SEE IF PROGRAM JUST RESTARTED, BR IF YES
022656                          READEF  #EF.RESTART
022656  012700  000037                                                  MOV     #EF.RESTART,R0
022662  104447                                                          TRAP    C$REFG
022664                          BCOMPLETE       STARST
022664  103411                                                          BCS     STARST

                        ;SEE IF THIS IS A NEW PASS, BR IF YES
022666                          READEF  #EF.NEW
022666  012700  000035                                                  MOV     #EF.NEW,R0
022672  104447                                                          TRAP    C$REFG
022674                          BCOMPLETE       NEWST
022674  103411                                                          BCS     NEWST

                        ;SEE IF PROGRAM WAS JUST CONTINUED
022676                          READEF  #EF.CONTINUE
022676  012700  000036                                                  MOV     #EF.CONTINUE,R0
022702  104447                                                          TRAP    C$REFG
022704                          BCOMPLETE       ENDIT
022704  103473                                                          BCS     ENDIT
022706  000414                  BR      GETPRM

022710                  STARST:
```

```
4465  022710  005037  002412                  CLR     STARES          ;CLEAR FLAG TO SHOW JUST HAD STA OR RES
4466
4467                                          ;CLEAR DEVICE MAP
4468  022714  005037  002404                  CLR     DEVMAP
4469  022720                                  NEWST:
4470  022720  012737  177777  002334          MOV     #-1,LOGDEV      ;RESET LOGICAL DEVICE TO -1
4471  022726  005237  002412                  INC     STARES          ;INCREMENT NO. OF PASSES SINCE STA OR RES
4472  022732  012737  000001  002406          MOV     #BIT0,DEVPTR    ;INIT DEVICE MAP BIT POINTER
4473
4474                                          ; GET UNIBUS ADDRESS, VECTOR, PRIORITY LEVEL, SWITCH PACKS, TEST
4475                                          ;   CONNECTOR INFORMATION FOR THIS LOGICAL DEVICE
4476  022740                                  GETPRM:
4477  022740  005237  002334                  INC     LOGDEV          ;INCREMENT LOGICAL DEVICE NUMBER
4478  022744                                  GPHARD  LOGDEV,R1       ;GET P-TABLE POINTER INTO R1
4479  022744  013700  002334                                                          MOV     LOGDEV,R0
4480  022750  104442                                                                  TRAP    C$GPHRD
4481  022752  010001                                                                  MOV     R0,R1
4482  022754                                  BCOMPLETE       10$     ;BR IF DEVICE AVAILABLE
4483  022754  103403                                                                  BCS     10$
4484  022756  006337  002406                  ASL     DEVPTR          ;SHIFT DEVICE POINTER
4485  022762  000766                          BR      GETPRM          ;SKIP THIS DEVICE
4486  022764  053737  002406  002404  10$:    BIS     DEVPTR,DEVMAP   ;SET BIT FOR THIS DEVICE
4487  022772  006337  002406                  ASL     DEVPTR          ;SHIFT BIT POINTER
4488
4489  022776  012102                          MOV     (R1)+,R2        ;R2=CSR ADDR VALUE
4490  023000  012703  002416                  MOV     #MPCSR,R3       ;R3=POINTER TO CSR ADDR STORAGE AREA
4491
4492  023004  010223                  11$:    MOV     R2,(R3)+        ;PUT CSR ADDRESSES IN 'BSEL' AREA
4493  023006  005202                          INC     R2              ;BUMP BSEL ADDR
4494  023010  022703  002456                  CMP     #BSEL17+2,R3    ;ALL 16 ADDRESSES MOVED ?
4495  023014  001373                          BNE     11$             ;NO: DO ANOTHER ADDRESS
4496                                                                  ;YES: CONTINUE
4497
4498  023016  011137  002456                  MOV     (R1),MPIVEC     ;GET DMV11 INPUT INTRPT VECTOR
4499  023022  012137  002460                  MOV     (R1)+,MPOVEC
4500  023026  062737  000004  002460          ADD     #4,MPOVEC       ;GET DMV11 OUTPUT INTRPT VECTOR
4501  023034  012137  002462                  MOV     (R1)+,MPRIOR    ;GET DMV11 DEVICE PRIORITY
4502  023040  012137  002464                  MOV     (R1)+,LUSWI1    ;GET LU SWITCH PACK #1
4503  023044  012137  002466                  MOV     (R1)+,LUSWI2    ;GET LU SWITCH PACK #2
4504  023050  012137  002470                  MOV     (R1)+,BRDTYP    ;GET DMV-11 BOARD TYPE
4505  023054  012137  002472                  MOV     (R1)+,TSTCON    ;GET TEST CONNECTOR INDICATOR
4506  023060  011137  002474                  MOV     (R1),BDRATE     ;GET BAUD RATE FOR THIS DEVICE
4507                                  ;ISSUE LSI BUS RESET, TO INIT DMV11
4508  023064                                  BRESET
4509  023064  104433                                                                 TRAP    C$RESET
4510  023066  005000                          CLR     R0              ;# TIME DELAY TO ALLOW COMPLETION
4511  023070  000240                  15$:    NOP                     ;# OF DMV11 MICRODIAGNOSTICS.
4512  023072  077002                          SOB     R0,15$          ;#
4513  023074                          ENDIT:
4514  023074                                  ENDINIT
4515  023074                                                                  L10013:
4516  023074  104411                                                                 TRAP    C$INIT
```

```
                                .SBTTL AUTO DROP UNIT SECTION

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

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

023076                                  BGNAUTO
023076                                                                  L$AUTO::

023076                                  SETVEC  #4,#AD.HIT,#0   ;SETUP INVALID-ADDRESS TRAP VECTOR
023076  012746  000000                                                  MOV     #0,-(SP)
023102  012746  023214                                                  MOV     #AD.HIT,-(SP)
023106  012746  000004                                                  MOV     #4,-(SP)
023112  012746  000003                                                  MOV     #3,-(SP)
023116  104437                                                          TRAP    C$SVEC
023120  062706  000010                                                  ADD     #10,SP
023124  005037  002546                  CLR     TMP0            ;INITIALIZE TRAP FLAG REGISTER
023130  012702  000001                  MOV     #1,R2           ;FLAG BIT
023134  013703  002416                  MOV     BSEL0,R3        ;INIT ADDRESS POINTER

023140  105723                  1$:     TSTB    (R3)+           ;ACCESS THE CSR'S BY BYTES.
023142  006302                          ASL     R2
023144  103375                          BCC     1$

023146  013703  002416                  MOV     BSEL0,R3        ;RE-INIT ADDRESS POINTER
023152  012702  000001                  MOV     #1,R2           ;RE-INIT FLAG BIT
023156  005723                  2$:     TST     (R3)+           ;ACCESS THE CSR'S BY WORDS.
023160  006302                          ASL     R2
023162  006302                          ASL     R2
023164  103374                          BCC     2$

023166                                  CLRVEC  #4              ;RESTORE THE VECTOR TO DS
023166  012700  000004                                                  MOV     #4,R0
023172  104436                                                          TRAP    C$CVEC
023174  005737  002546                  TST     TMP0            ;DID WE GET HIT WITH AN INVALID ADDRESS TRAP?
023200  001403                          BEQ     AD.OK           ;NO,  EXIT TEST
023202                                  DODU    LOGDEV          ;YES, DROP THIS LOGICAL DEV.
023202  013700  002334                                                  MOV     LOGDEV,R0
023206  104451                                                          TRAP    C$DODU
```

```
 4567  023210  000240                AD.OK:  NOP                     ;(FOR PATCHING IN A HALT IF NECESSARY)
 4568
 4569  023212                              ENDAUTO
 4570  023212                                                                  L10014:
 4571  023212  104461                                                                  TRAP    C$AUTO
 4572
 4573  023214  050237  002546        AD.HIT: BIS     R2,TMP0         ;FLAG THE HIT IF WE GET IT!
 4574  023220  000002                        RTI                     ;RETURN
 4575
```

```
                                .SBTTL  CLEANUP CODING SECTION

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

                                        BGNCLN
                                                                        L$CLEAN::

                                        ENDCLN
                                                                        L10015:
                                                                                TRAP    C$CLEAN
```

```
                        .SBTTL  DROP UNIT SECTION

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

023224                          BGNDU
023224                                                                  L$DU::
                        ;ISSUE UNIBUS RESET TO CLEAN UP
023224                          BRESET
023224  104433                                                                  TRAP    C$RESET
023226                          ENDDU
023226                                                                  L10016:
023226  104453                                                                  TRAP    C$DU
```

```
                        .SBTTL  ADD UNIT SECTION

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

                                BGNAU

                                                                L$AU::

                                ENDAU

                                                                L10017:
023230  104452                                                          TRAP    C$AU
```

```
                                .SBTTL  TEST 1 -- RX DATA FLUSHING TEST

                                ;+*********************************************************************************
                                ;*
                                ;*      TEST 1 -- RX DATA FLUSHING TEST
                                ;*
                                ;*
                                ;*  IN BCP MODE/HALF DUPLEX IT IS DESIRABLE TO HAVE THE ABILITY TO FLUSH
                                ;*  THE USYRT OF ITS CRC CHARACTERS. THIS FLUSHING IS ACCOMPLISHED BY READING
                                ;*  TO THE VIA SHIFT REGISTER.
                                ;*  THIS TEST VERIFIES THAT WHEN THE VIA SR IS READ, 8 PULSES WILL
                                ;*  BE GENERATED AT THE CB1 PIN (WHICH DIRECTLY FEEDS THE CHARACTER FIFO).
                                ;*
                                ;--*********************************************************************************
                                ;
                                ;       BGNTST
023232                                                                  T1::
023232  004737  005376                JSR     PC,INIDMV       ;INIT DMV-11, ENTER M-LOOP
023236  004537  007234                JSR     R5,INITRN       ;LOAD 1 SOM, CLK TX UNTIL ACTIVE
023242  063626                        DDCMP!NOCHK!SYNCH!STRIPS ;SET DDCMP,NO CHECK,SYNCH=226
023244  000000                        0                       ;USE 8 BIT CHARS
023246  103003                        BCC     .+8.            ;BR IF NO ERROR
023250                                ERROR                   ;REPORT STACKED ERROR
023250  104460                                                                    TRAP    C$ERROR
023252                                ESCAPE  TST             ;SKIP TO END OF TEST
023252  104410                                                                    TRAP    C$ESCAPE
023254  000254                                                                    .WORD   L10020-.

023256  004537  003712                JSR     R5,WRITEI       ;SET SHIFT REGISTER TO
023262  120013                        VIAACR                  ; "SYSTEM CLOCK RATE" MODE (CB1=CLK)
023264  000210                        210                     ;(BIT 7 PREVIOUSLY SET)
023266  103003                        BCC     .+8.            ;BR IF NO ERROR
023270                                ERROR                   ; REPORT STACKED ERROR
023270  104460                                                                    TRAP    C$ERROR
023272                                ESCAPE  TST             ;SKIP TO END OF TEST
023272  104410                                                                    TRAP    C$ESCAPE
023274  000234                                                                    .WORD   L10020-.

023276  004537  010250                JSR     R5,TXCTRL       ;OUTPUT 1ST SYNC CHARACTER
023302  000001                        TSOM                    ;AND KNOCK DOWN TBMT
023304  000007                        7.

023306  004537  010250                JSR     R5,TXCTRL       ;OUTPUT 2ND SYNC CHARACTER
023312  000001                        TSOM                    ;AND KNOCK DOWN TBMT
023314  000010                        8.

023316  004537  010250                JSR     R5,TXCTRL       ;CLEAR TSOM (GET READY TO SEND DATA)
023322  000000                        000
023324  000000                        0

023326  004537  010136                JSR     R5,TXCHAR       ;LOAD 125, TX 3RD SYNCH
023332  000125                        125
023334  000010                        8.
023336  103003                        BCC     .+8.            ;BR IF NO ERROR
```

```
4674  023340                          ERROR                   ;REPORT STACKED ERROR
4675  023340  104460                                                  TRAP    C$ERROR
4676  023342                          ESCAPE  TST             ;SKIP TO END OF TEST
4677  023342  104410                                                  TRAP    C$ESCAPE
4678  023344  000164                                                  .WORD   L10020-.
4679                          ;-------------------------------------------------------------------
4680  023346  012702  000004        MOV     #4,R2           ;** TRANSFER 4 CHARACTERS **
4681
4682  023352  004537  003712  1$:   JSR     R5,WRITEI       ;SET RTS & FULL DUPLEX (SO STEPLU WORKS)
4683  023356  120000                VIAORB
4684  023360  000142                TXEN!RXEN!TTLOOP
4685  023362  103003                BCC     .+8.            ;BR IF NO ERROR
4686  023364                        ERROR                   ; REPORT STACKED ERROR
4687  023364  104460                                                  TRAP    C$ERROR
4688  023366                        ESCAPE  TST             ;SKIP TO END OF TEST
4689  023366  104410                                                  TRAP    C$ESCAPE
4690  023370  000140                                                  .WORD   L10020-.
4691
4692  023372  004537  012072        JSR     R5,STEPLU       ;FLIP TSO BIT VALUE(WILL BE SHIFTED INTO
4693  023376  000001                1                       ; FIFO DURING FLUSHING).
4694
4695  023400  004537  003712        JSR     R5,WRITEI       ;CLEAR RTS, SET HDX (SO THAT SR CLOCK WORKS)
4696  023404  120000                VIAORB
4697  023406  000152                TXEN!RXEN!RTSND!TTLOOP  ;#
4698  023410  103003                BCC     .+8.            ;BR IF NO ERROR
4699  023412                        ERROR                   ; REPORT STACKED ERROR
4700  023412  104460                                                  TRAP    C$ERROR
4701  023414                        ESCAPE  TST             ;SKIP TO END OF TEST
4702  023414  104410                                                  TRAP    C$ESCAPE
4703  023416  000112                                                  .WORD   L10020-.
4704
4705  023420  004537  003566        JSR     R5,READI        ;READ VIA SHIFT REGISTER (SHOULD CAUSE
4706  023424  120012                VIASR                   ; 8 CLOCKS FROM CB1 LEAD => FIFO)
4707  023426  000000                000
4708  023430  103003                BCC     .+8.            ;BR IF NO ERROR
4709  023432                        ERROR                   ; REPORT STACKED ERROR
4710  023432  104460                                                  TRAP    C$ERROR
4711  023434                        ESCAPE  TST             ;SKIP TO END OF TEST
4712  023434  104410                                                  TRAP    C$ESCAPE
4713  023436  000072                                                  .WORD   L10020-.
4714
4715  023440  077234                SOB     R2,1$           ;** LOOP UNTIL ALL 4 SENT (VIA CB1) **
4716                          ;-------------------------------------------------------------------
4717  023442  004537  010350        JSR     R5,RXCHAR       ;READ AND CHECK FOR 377
4718  023446  000377                377                     ;* ERROR HERE INDICATES HI-SPEED SR CLOCK
4719  023450  000000                0                       ;* DIDN'T WORK.
4720  023452  100000                NOCRDA
4721  023454  103003                BCC     .+8.            ;BR IF NO ERROR
4722  023456                        ERROR                   ;REPORT STACKED ERROR
4723  023456  104460                                                  TRAP    C$ERROR
4724  023460                        ESCAPE  TST             ;SKIP TO END OF TEST
4725  023460  104410                                                  TRAP    C$ESCAPE
4726  023462  000046                                                  .WORD   L10020-.
4727
4728  023464  004537  010350        JSR     R5,RXCHAR       ;READ AND CHECK FOR 000
4729  023470  000003                003                     ;* ERROR HERE INDICATES HI-SPEED SR CLOCK
```

```
 4730  023472  000000                    0                       ;* DIDN'T WORK.
 4731  023474  100000                    NOCRDA
 4732  023476  103003                    BCC     .+8.            ;BR IF NO ERROR
 4733  023500                            ERROR                   ;REPORT STACKED ERROR
 4734  023500  104460                                                    TRAP    C$ERROR
 4735  023502                            ESCAPE  TST             ;SKIP TO END OF TEST
 4736  023502  104410                                                    TRAP    C$ESCAPE
 4737  023504  000024                                                    .WORD   L10020-.
 4738
 4739  023506  004537  010350            JSR     R5,RXCHAR       ;READ AND CHECK FOR 377
 4740  023512  000360                    360                     ;* ERROR HERE INDICATES HI-SPEED SR CLOCK
 4741  023514  000000                    0                       ;* DIDN'T WORK
 4742  023516  100000                    NOCRDA
 4743  023520  103003                    BCC     .+8.            ;BR IF NO ERROR
 4744  023522                            ERROR                   ;REPORT STACKED ERROR
 4745  023522  104460                                                    TRAP    C$ERROR
 4746  023524                            ESCAPE  TST             ;SKIP TO END OF TEST
 4747  023524  104410                                                    TRAP    C$ESCAPE
 4748  023526  000002                                                    .WORD   L10020-.
 4749  023530                    ENDTST
 4750  023530                                                    L10020:
 4751  023530  104401                                                    TRAP    C$ETST
```

```
                        .SBTTL  TEST 2 -- INTEGRAL MODEM INTERFACE TEST

                        ;++*************************************************************************
                        ;*
                        ;*      TEST 2 -- INTEGRAL MODEM INTERFACE TEST
                        ;*
                        ;*  THE INTEGRAL MODEM IS SELECTED BY THE PROGRAM AND A MESSAGE IS
                        ;*  TRANSMITTED,  RECEIVED,  AND CHECKED USING A TURNAROUND CONNECTOR ON
                        ;*  THE  BOARD  OR  AT THE END OF A CABLE. THE FOLLOWING MESSAGE WILL BE
                        ;*  SENT IN BCP MODE WITH CRC-16 SPECIFIED:
                        ;*
                        ;*      SYNC SYNC 000 125 252 377 000 CRC1 CRC2 SYNC
                        ;*
                        ;*  IF  THE  P-TABLE  FOR  THE  CURRENT  UNIT INDICATES THAT NO EXTERNAL
                        ;*  TURNAROUND IS PROVIDED, THE TEST WILL BE SKIPPED FOR THAT UNIT.
                        ;*
                        ;--*************************************************************************
                        ;
023532                  ;       BGNTST                                                  T2::
023532  012737  000002  002414          MOV     #2.,TSTNUM      ;SET TEST NO. FOR POSSIBLE PRINTOUT
023540  004737  005376                  JSR     PC,INIDMV       ;INIT DMV-11, ENTER MAINT LOOP
023544  004537  007532                  JSR     R5,CKLPBK       ;SEE IF THIS INTERFACE CAN BE RUN
023550  000001                          INTGRL
023552  103002                          BCC     2$              ;BR IF YES
023554                                  EXIT    TST             ;WRONG INTERFACE - SKIP TEST
023554  104432                                                                  TRAP    C$EXIT
023556  001630                                                                  .WORD   L10021-.
                        ;LOAD 6502 MICROCODE FOR INTEGRAL MODEM TEST INTO RAM PAGE 2
                        2$:     MOV     #^CODE,R1       ;GET STARTING ADRS OF DMV MICROCODE
                                MOV     #RAMADR,R2      ;GET STARTING ADRS OF RAM PAGE 2
                        3$:     MOVB    (R1)+,6$        ;SET DATA BYTE TO BE WRITTEN
                                MOV     R2,4$           ;SET RAM WRITE ADRS
                                JSR     R5,WRITEI       ;WRITE A DATA BYTE INTO RAM
                        4$:     .WORD   0
                        6$:     .WORD   0
                                INC     R2              ;INCR RAM ADRS
                                CMP     R1,#ENDCOD      ;SEE IF ALL CODE LOADED YET
                                BLO     3$              ;BR IF NOT

                        ;READ AND VERIFY 6502 MICROCODE IN RAM
                                MOV     #^CODE,R1       ;GET STARTING ADRS OF DMV MICROCODE TO CHECK
                                MOV     #RAMADR,R2      ;GET STARTING ADRS OF RAM PAGE 2
                        8$:     MOV     R2,10$          ;SET RAM READ ADRS
                                JSR     R5,READI        ;READ A RAM BYTE
                        10$:    .WORD   0
                        12$:    .WORD   0
                                CMPB    (R1)+,12$       ;SEE IF BYTE IS CORRECT
                                BEQ     16$             ;BR IF CORRECT
                                MOV     R2,REGNUM       ;SET RAM ADRS FOR ERROR REPORT
                                CLR     GDATA           ;SET EXPECTED RAM DATA
                                MOVB    -1(R1),GDATA
                                CLR     BDATA           ;SET ACTUAL RAM DATA
                                MOVB    12$,BDATA
                        ;REPORT RAM ERROR LOADING MICROCODE
```

```
4808  023702                                  GEDF    EM79,ERR13
4809                                                  ;       "DEVICE FATAL" ERROR # 38
4810  023702  104455                                                          TRAP    C$ERDF
4811  023704  000046                                                          .WORD   38
4812  023706  015125                                                          .WORD   EM79
4813  023710  021030                                                          .WORD   ERR13
4814  023712                                  ESCAPE  TST
4815  023712  104410                                                          TRAP    C$ESCAPE
4816  023714  001472                                                          .WORD   L10021-.
4817  023716  005202                  16$:    INC     R2              ;INCR RAM ADRS
4818  023720  020127  026235                CMP     R1,#ENDCOD      ;SEE IF ALL CODE CHECKED YET
4819  023724  103741                        BLO     8$              ;BR IF NOT
4820
4821                                  ;SET UP VIA AND USYRT FOR OPERATION
4822  023726  004537  003712                JSR     R5,WRITEI       ;RESET THE USYRT
4823  023732  120000                        VIAORB
4824  023734  000031                        RTSND!DTR!PRESET
4825  023736  004537  003712                JSR     R5,WRITEI       ;CLEAR USYRT RESET BIT
4826  023742  120000                        VIAORB
4827  023744  000030                        RTSND!DTR
4828  023746  004537  003712                JSR     R5,WRITEI       ;SET SYNCH CHAR = 226
4829  023752  120404                        PCSARL
4830  023754  000226                        226
4831  023756  012737  065400  023..        MOV     #DDCMP!STRIPS!IDLES!CRC16,18$   ;SET DDCMP,STRIP,IDLE, CRC16
4832  023764  000337  023776                SWAB    18$             ;GET DATA INTO LO BYTE
4833  023770  004537  003712                JSR     R5,WRITEI       ;PROGRAM THE PCSARH
4834  023774  120405                        PCSARH
4835  023776  000000                18$:    .WORD   0
4836  024000  004537  005410                JSR     R5,CKUSTS       ;CHK USYRT STATUS FOR INITIALIZED STATE
4837  024004  000110                        110                     ;  TBMT=1, TSO=1
4838  024006  103003                        BCC     .+8.            ;IF ERROR, PRINT REPORT
4839  024010                                ERROR
4840  024010  104460                                                          TRAP    C$ERROR
4841  024012                                  ESCAPE  TST
4842  024012  104410                                                          TRAP    C$ESCAPE
4843  024014  001372                                                          .WORD   L10021-.
4844  024016  004537  003712                JSR     R5,WRITEI       ;SET TSOM IN USYRT
4845  024022  120403                        TDSRH
4846  024024  000001                        TSOM
4847  024026  004537  003712                JSR     R5,WRITEI       ;LOAD 237 CHAR FOR INTGRL MODEM SYNCHRONIZATION
4848  024032  120402                        TDSRL
4849  024034  000237                        237
4850  024036  004537  006014                JSR     R5,CKTBMT       ;CHK FOR TBMT = 0
4851  024042  000000                        0
4852  024044  103003                        BCC     .+8.            ;IF ERROR, REPORT ERROR
4853  024046                                ERROR
4854  024046  104460                                                          TRAP    C$ERROR
4855  024050                                  ESCAPE  TST
4856  024050  104410                                                          TRAP    C$ESCAPE
4857  024052  001334                                                          .WORD   L10021-.
4858
4859                                  ;INITIATE 6502 TEST OF INTEGRAL MODEM
4860  024054  005077  156346                CLR     @SEL4           ;CLEAR SEL4
4861  024060  012777  001000  156340        MOV     #RAMADR,@SEL4   ;SET START ADRS OF RAM CODE IN SEL4
4862  024066  112777  000005  156326        MOVB    #EXECUT,@SEL2   ;ISSUE M-LOOP CMND TO EXECUTE AT PC IN SEL4
4863                                  ;WAIT SEVERAL MILLI-SEC FOR COMPLETION OF TEST
```

```
 4864  024074  012701  023420            MOV     #10000.,R1      ;INIT WAIT LOOP COUNTER
 4865  024100  005301              22$:  DEC     R1              ;DECREMENT COUNTER
 4866  024102  000240                    NOP
 4867  024104  001375                    BNE     22$             ;BR IF NOT DONE COUNTING YET
 4868  024106  132777  000200  156306    BITB    #MRDY,@#SEL2    ;SEE IF M-LOOP FINISHED PROPERLY
 4869  024114  001013                    BNE     24$             ;BR IF YES
 4870  024116  004737  004166            JSR     PC,GETWSR       ;GET CSR'S FOR PRINTOUT
 4871  024122  012737  000005  002324    MOV     #EXECUT,GDATA   ;IDENTIFY REQUESTED FUNCTION
 4872                        ;REPORT MRDY TIMEOUT ERROR
 4873  024130                            GEDF    EM4,ERR4
 4874                                    ;       "DEVICE FATAL" ERROR # 39
 4875  024130  104455                                            TRAP    C$ERDF
 4876  024132  000047                                            .WORD   39
 4877  024134  014307                                            .WORD   EM4
 4878  024136  020120                                            .WORD   ERR4
 4879  024140                            ESCAPE  TST
 4880  024140  104410                                            TRAP    C$ESCAPE
 4881  024142  001244                                            .WORD   L10021-.
 4882
 4883  024144  105777  156262      24$:  TSTB    @#SEL6          ;SEE IF ANY ERRORS OCCURRED IN TEST
 4884  024150  001002                    BNE     26$             ;BR IF ERROR DETECTED
 4885  024152  000137  025406            JMP     90$             ;SUCCESSFUL COMPLETION OF TEST
 4886  024156  012737  000007  002336  26$:  MOV     #7,REGNUM       ;SET REG NO. FOR PRINTOUT
 4887  024164  005037  002324            CLR     GDATA           ;CLEAR EXPECTED DATA AREA
 4888  024170  005037  002326            CLR     @DATA           ;CLEAR ACTUAL DATA AREA
 4889                        ;CHK FOR ERROR 1
 4890  024174  127727  156232  000001    CMPB    @#SEL6,#1       ;CHK FOR ERROR 1
 4891  024202  001006                    BNE     28$             ;BR IF NOT
 4892                        ;REPORT TBMT NOT SET
 4893  024204                            GEDF    EM73,ERR12
 4894                                    ;       "DEVICE FATAL" ERROR # 40
 4895  024204  104455                                            TRAP    C$ERDF
 4896  024206  000050                                            .WORD   40
 4897  024210  014777                                            .WORD   EM73
 4898  024212  020714                                            .WORD   ERR12
 4899  024214                            ESCAPE  TST
 4900  024214  104410                                            TRAP    C$ESCAPE
 4901  024216  001170                                            .WORD   L10021-.
 4902                        ;CHK FOR ERROR 2
 4903  024220  127727  156206  000002  28$:  CMPB    @#SEL6,#2       ;CHK FOR ERROR 2
 4904  024226  001006                    BNE     30$             ;BR IF NOT
 4905                        ;REPORT TBMT NOT SET
 4906  024230                            GEDF    EM73,ERR12
 4907                                    ;       "DEVICE FATAL" ERROR # 41
 4908  024230  104455                                            TRAP    C$ERDF
 4909  024232  000051                                            .WORD   41
 4910  024234  014777                                            .WORD   EM73
 4911  024236  020714                                            .WORD   ERR12
 4912  024240                            ESCAPE  TST
 4913  024240  104410                                            TRAP    C$ESCAPE
 4914  024242  001144                                            .WORD   L10021-.
 4915                        ;CHK FOR ERROR 3
 4916  024244  127727  156162  000003  30$:  CMPB    @#SEL6,#3       ;CHK FOR ERROR 3
 4917  024252  001006                    BNE     31$             ;BR IF NOT
 4918                        ;REPORT TBMT NOT SET
 4919  024254                            GEDF    EM73,ERR12
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4920
4921  024254  104455                                                ;       "DEVICE FATAL" ERROR # 42
4922  024256  000052                                                                TRAP    C$ERDF
4923  024260  014777                                                                .WORD   42
4924  024262  020714                                                                .WORD   EM73
4925  024264                                                                        .WORD   ERR12
4926  024264  104410                                  ESCAPE  TST                   TRAP    C$ESCAPE
4927  024266  001120                                                                .WORD   L10021-.
4928                                  ;CHK FOR ERROR 4
4929  024270  127727  156136  000004  31$:    CMPB    @#SEL6,#4       ;CHK FOR ERROR 4
4930  024276  001011                  BNE     32$             ;BR IF NOT
4931                                  ;REPORT CARRIER NOT SET
4932  024300  012737  000001  002336          MOV     #1,REGNUM       ;SET REG NO. FOR PRINTOUT
4933  024306                                  GEDF    EM80,ERR14
4934                                                                ;       "DEVICE FATAL" ERROR # 43
4935  024306  104455                                                                TRAP    C$ERDF
4936  024310  000053                                                                .WORD   43
4937  024312  015161                                                                .WORD   EM80
4938  024314  021146                                                                .WORD   ERR14
4939  024316                                  ESCAPE  TST
4940  024316  104410                                                                TRAP    C$ESCAPE
4941  024320  001066                                                                .WORD   L10021-.
4942                                  ;CHK FOR ERROR 5
4943  024322  127727  156104  000005  32$:    CMPB    @#SEL6,#5       ;CHK FOR ERROR 5
4944  024330  001006                  BNE     34$             ;BR IF NOT
4945                                  ;REPORT TBMT NOT SET
4946  024332                                  GEDF    EM73,ERR12
4947                                                                ;       "DEVICE FATAL" ERROR # 44
4948  024332  104455                                                                TRAP    C$ERDF
4949  024334  000054                                                                .WORD   44
4950  024336  014777                                                                .WORD   EM73
4951  024340  020714                                                                .WORD   ERR12
4952  024342                                  ESCAPE  TST
4953  024342  104410                                                                TRAP    C$ESCAPE
4954  024344  001042                                                                .WORD   L10021-.
4955                                  ;CHK FOR ERROR 6
4956  024346  127727  156060  000006  34$:    CMPB    @#SEL6,#6       ;CHK FOR ERROR 6
4957  024354  001006                  BNE     36$             ;BR IF NOT
4958                                  ;REPORT TBMT NOT SET
4959  024356                                  GEDF    EM73,ERR12
4960                                                                ;       "DEVICE FATAL" ERROR # 45
4961  024356  104455                                                                TRAP    C$ERDF
4962  024360  000055                                                                .WORD   45
4963  024362  014777                                                                .WORD   EM73
4964  024364  020714                                                                .WORD   ERR12
4965  024366                                  ESCAPE  TST
4966  024366  104410                                                                TRAP    C$ESCAPE
4967  024370  001016                                                                .WORD   L10021-.
4968                                  ;CHK FOR ERROR 7
4969  024372  127727  156034  000007  36$:    CMPB    @#SEL6,#7       ;CHK FOR ERROR 7
4970  024400  001006                  BNE     38$             ;BR IF NOT
4971                                  ;REPORT TBMT NOT SET
4972  024402                                  GEDF    EM73,ERR12
4973                                                                ;       "DEVICE FATAL" ERROR # 46
4974  024402  104455                                                                TRAP    C$ERDF
4975  024404  000056                                                                .WORD   46
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 4976  024406  014777                                                          .WORD   EM73
 4977  024410  020714                                                          .WORD   ERR12
 4978  024412                          ESCAPE  TST
 4979  024412  104410                                                          TRAP    C$ESCAPE
 4980  024414  000772                                                          .WORD   L10021-.
 4981                          ;CHK FOR ERROR 8
 4982  024416  127727  156010  000010  38$:    CMPB    @#SEL6,#8.      ;CHK FOR ERROR 8
 4983  024424  001006                  BNE     40$             ;BR IF NOT
 4984                          ;REPORT TBMT NOT SET
 4985  024426                          GEDF    EM73,ERR12
 4986                                                          ;       "DEVICE FATAL" ERROR # 47
 4987  024426  104455                                                          TRAP    C$ERDF
 4988  024430  000057                                                          .WORD   47
 4989  024432  014777                                                          .WORD   EM73
 4990  024434  020714                                                          .WORD   ERR12
 4991  024436                          ESCAPE  TST
 4992  024436  104410                                                          TRAP    C$ESCAPE
 4993  024440  000746                                                          .WORD   L10021-.
 4994                          ;CHK FOR ERROR 9
 4995  024442  127727  155764  000011  40$:    CMPB    @#SEL6,#9.      ;CHK FOR ERROR 9
 4996  024450  001006                  BNE     42$             ;BR IF NOT
 4997                          ;REPORT RDA NOT SET
 4998  024452                          GEDF    EM75,ERR12
 4999                                                          ;       "DEVICE FATAL" ERROR # 48
 5000  024452  104455                                                          TRAP    C$ERDF
 5001  024454  000060                                                          .WORD   48
 5002  024456  015035                                                          .WORD   EM75
 5003  024460  020714                                                          .WORD   ERR12
 5004  024462                          ESCAPE  TST
 5005  024462  104410                                                          TRAP    C$ESCAPE
 5006  024464  000722                                                          .WORD   L10021-.
 5007                          ;CHK FOR ERROR 10
 5008  024466  127727  155740  000012  42$:    CMPB    @#SEL6,#10.     ;CHK FOR ERROR 10
 5009  024474  001017                  BNE     44$             ;BR IF NOT
 5010                          ;REPORT RCV'D DATA MISCOMPARE ERROR
 5011  024476  012737  000000  002336          MOV     #0,REGNUM       ;SET REG NO. FOR PRINTOUT
 5012  024504  112737  000000  002324          MOVB    #000,GDATA      ;SET EXPECTED DATA
 5013  024512  117737  155716  002326          MOVB    @#SEL7,BDATA    ;SET ACTUAL DATA
 5014  024520                          GEDF    EM34,ERR10
 5015                                                          ;       "DEVICE FATAL" ERROR # 49
 5016  024520  104455                                                          TRAP    C$ERDF
 5017  024522  000061                                                          .WORD   49
 5018  024524  014502                                                          .WORD   EM34
 5019  024526  020364                                                          .WORD   ERR10
 5020  024530                          ESCAPE  TST
 5021  024530  104410                                                          TRAP    C$ESCAPE
 5022  024532  000654                                                          .WORD   L10021-.
 5023                          ;CHK FOR ERROR 11
 5024  024534  127727  155672  000013  44$:    CMPB    @#SEL6,#11.     ;CHK FOR ERROR 11
 5025  024542  001006                  BNE     46$             ;BR IF NOT
 5026                          ;REPORT RDA NOT SET
 5027  024544                          GEDF    EM75,ERR12
 5028                                                          ;       "DEVICE FATAL" ERROR # 50
 5029  024544  104455                                                          TRAP    C$ERDF
 5030  024546  000062                                                          .WORD   50
 5031  024550  015035                                                          .WORD   EM75
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5032  024552  020714                                                          .WORD   ERR12
5033  024554                          ESCAPE  TST
5034  024554  104410                                                          TRAP    C$ESCAPE
5035  024556  000630                                                          .WORD   L10021-.
5036                          ;CHK FOR ERROR 12
5037  024560  127727  155646  000014  46$:    CMPB    @BSEL6,#12.     ;CHK FOR ERROR 12
5038  024566  001017                  BNE     48$             ;BR IF NOT
5039                          ;REPORT RCV'D DATA MISCOMPARE ERROR
5040  024570  012737  000000  002336          MOV     #0,REGNUM       ;SET REG NO. FOR PRINTOUT
5041  024576  112737  000125  002324          MOVB    #125,GDATA      ;SET EXPECTED DATA
5042  024604  117737  155624  002326          MOVB    @BSEL7,BDATA    ;SET ACTUAL DATA
5043  024612                  GEDF    EM34,ERR10
5044                                          ;       "DEVICE FATAL" ERROR # 51
5045  024612  104455                                                          TRAP    C$ERDF
5046  024614  000063                                                          .WORD   51
5047  024616  014502                                                          .WORD   EM34
5048  024620  020364                                                          .WORD   ERR10
5049  024622                          ESCAPE  TST
5050  024622  104410                                                          TRAP    C$ESCAPE
5051  024624  000562                                                          .WORD   L10021-.
5052                          ;CHK FOR ERROR 13
5053  024626  127727  155600  000015  48$:    CMPB    @BSEL6,#13.     ;CHK FOR ERROR 13
5054  024634  001006                  BNE     50$             ;BR IF NOT
5055                          ;REPORT RDA NOT SET
5056  024636                  GEDF    EM75,ERR12
5057                                          ;       "DEVICE FATAL" ERROR # 52
5058  024636  104455                                                          TRAP    C$ERDF
5059  024640  000064                                                          .WORD   52
5060  024642  015035                                                          .WORD   EM75
5061  024644  020714                                                          .WORD   ERR12
5062  024646                          ESCAPE  TST
5063  024646  104410                                                          TRAP    C$ESCAPE
5064  024650  000536                                                          .WORD   L10021-.
5065                          ;CHK FOR ERROR 14
5066  024652  127727  155554  000016  50$:    CMPB    @BSEL6,#14.     ;CHK FOR ERROR 14
5067  024660  001017                  BNE     52$             ;BR IF NOT
5068                          ;REPORT RCV'D DATA MISCOMPARE ERROR
5069  024662  012737  000000  002336          MOV     #0,REGNUM       ;SET REG NO. FOR PRINTOUT
5070  024670  112737  000252  002324          MOVB    #252,GDATA      ;SET EXPECTED DATA
5071  024676  117737  155532  002326          MOVB    @BSEL7,BDATA    ;SET ACTUAL DATA
5072  024704                  GEDF    EM34,ERR10
5073                                          ;       "DEVICE FATAL" ERROR # 53
5074  024704  104455                                                          TRAP    C$ERDF
5075  024706  000065                                                          .WORD   53
5076  024710  014502                                                          .WORD   EM34
5077  024712  020364                                                          .WORD   ERR10
5078  024714                          ESCAPE  TST
5079  024714  104410                                                          TRAP    C$ESCAPE
5080  024716  000470                                                          .WORD   L10021-.
5081                          ;CHK FOR ERROR 15
5082  024720  127727  155506  000017  52$:    CMPB    @BSEL6,#15.     ;CHK FOR ERROR 15
5083  024726  001006                  BNE     54$             ;BR IF NOT
5084                          ;REPORT RDA NOT SET
5085  024730                  GEDF    EM75,ERR12
5086                                          ;       "DEVICE FATAL" ERROR # 54
5087  024730  104455                                                          TRAP    C$ERDF
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5088  024732  000066                                                          .WORD   54
5089  024734  015035                                                          .WORD   EM75
5090  024736  020714                                                          .WORD   ERR12
5091  024740                          ESCAPE  TST
5092  024740  104410                                                          TRAP    C$ESCAPE
5093  024742  000444                                                          .WORD   L10021-.
5094                          ;CHK FOR ERROR 16
5095  024744  127727  155462  000020 54$:    CMPB    @BSEL6,#16.     ;CHK FOR ERROR 16
5096  024752  001017                  BNE     56$             ;BR IF NOT
5097                          ;REPORT RCV'D DATA MISCOMPARE ERROR
5098  024754  012737  000000  002336        MOV     #0,REGNUM       ;SET REG NO. FOR PRINTOUT
5099  024762  112737  000377  002324        MOVB    #377,GDATA      ;SET EXPECTED DATA
5100  024770  117737  155440  002326        MOVB    @BSEL7,BDATA    ;SET ACTUAL DATA
5101  024776                  GEDF    EM34,ERR10
5102                                                  ;       "DEVICE FATAL" ERROR # 55
5103  024776  104455                                                          TRAP    C$ERDF
5104  025000  000067                                                          .WORD   55
5105  025002  014502                                                          .WORD   EM34
5106  025004  020364                                                          .WORD   ERR10
5107  025006                          ESCAPE  TST
5108  025006  104410                                                          TRAP    C$ESCAPE
5109  025010  000376                                                          .WORD   L10021-.
5110                          ;CHK FOR ERROR 17
5111  025012  127727  155414  000021 56$:    CMPB    @BSEL6,#17.     ;CHK FOR ERROR 17
5112  025020  001006                  BNE     58$             ;BR IF NOT
5113                          ;REPORT RDA NOT SET
5114  025022                  GEDF    EM75,ERR12
5115                                                  ;       "DEVICE FATAL" ERROR # 56
5116  025022  104455                                                          TRAP    C$ERDF
5117  025024  000070                                                          .WORD   56
5118  025026  015035                                                          .WORD   EM75
5119  025030  020714                                                          .WORD   ERR12
5120  025032                          ESCAPE  TST
5121  025032  104410                                                          TRAP    C$ESCAPE
5122  025034  000352                                                          .WORD   L10021-.
5123                          ;CHK FOR ERROR 18
5124  025036  127727  155370  000022 58$:    CMPB    @BSEL6,#18.     ;CHK FOR ERROR 18
5125  025044  001017                  BNE     60$             ;BR IF NOT
5126                          ;REPORT RCV'D DATA MISCOMPARE ERROR
5127  025046  012737  000000  002336        MOV     #0,REGNUM       ;SET REG NO. FOR PRINTOUT
5128  025054  112737  000000  002324        MOVB    #000,GDATA      ;SET EXPECTED DATA
5129  025062  117737  155346  002326        MOVB    @BSEL7,BDATA    ;SET ACTUAL DATA
5130  025070                  GEDF    EM34,ERR10
5131                                                  ;       "DEVICE FATAL" ERROR # 57
5132  025070  104455                                                          TRAP    C$ERDF
5133  025072  000071                                                          .WORD   57
5134  025074  014502                                                          .WORD   EM34
5135  025076  020364                                                          .WORD   ERR10
5136  025100                          ESCAPE  TST
5137  025100  104410                                                          TRAP    C$ESCAPE
5138  025102  000304                                                          .WORD   L10021-.
5139                          ;CHK FOR ERROR 19
5140  025104  127727  155322  000023 60$:    CMPB    @BSEL6,#19.     ;CHK FOR ERROR 19
5141  025112  001006                  BNE     62$             ;BR IF NOT
5142                          ;REPORT RERR NOT SET
5143  025114                  GEDF    EM36,ERR10
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5144                                                        ;       "DEVICE FATAL" ERROR # 58
5145  025114  104455                                                  TRAP    C$ERDF
5146  025116  000072                                                  .WORD   58
5147  025120  014551                                                  .WORD   EM36
5148  025122  020364                                                  .WORD   ERR10
5149  025124                          ESCAPE  TST
5150  025124  104410                                                  TRAP    C$ESCAPE
5151  025126  000260                                                  .WORD   L10021-.
5152                            ;CHK FOR ERROR 20
5153  025130  127727  155276  000024  62$:    CMPB    @BSEL6,#20.     ;CHK FOR ERROR 20
5154  025136  001006                  BNE     64$             ;BR IF NOT
5155                            ;REPORT RDA NOT SET
5156  025140                          GEDF    EM75,ERR12
5157                                                        ;       "DEVICE FATAL" ERROR # 59
5158  025140  104455                                                  TRAP    C$ERDF
5159  025142  000073                                                  .WORD   59
5160  025144  015035                                                  .WORD   EM75
5161  025146  020714                                                  .WORD   ERR12
5162  025150                          ESCAPE  TST
5163  025150  104410                                                  TRAP    C$ESCAPE
5164  025152  000234                                                  .WORD   L10021-.
5165                            ;CHK FOR ERROR 21
5166  025154  127727  155252  000025  64$:    CMPB    @BSEL6,#21.     ;CHK FOR ERROR 21
5167  025162  001017                  BNE     66$             ;BR IF NOT
5168                            ;REPORT RCV'D DATA MISCOMPARE ERROR
5169  025164  012737  000000  002336          MOV     #0,REGNUM       ;SET REG NO. FOR PRINTOUT
5170  025172  112737  000160  002324          MOVB    #160,GDATA      ;SET EXPECTED DATA
5171  025200  117737  155230  002326          MOVB    @BSEL7,BDATA    ;SET ACTUAL DATA
5172  025206                          GEDF    EM34,ERR10
5173                                                        ;       "DEVICE FATAL" ERROR # 60
5174  025206  104455                                                  TRAP    C$ERDF
5175  025210  000074                                                  .WORD   60
5176  025212  014502                                                  .WORD   EM34
5177  025214  020364                                                  .WORD   ERR10
5178  025216                          ESCAPE  TST
5179  025216  104410                                                  TRAP    C$ESCAPE
5180  025220  000166                                                  .WORD   L10021-.
5181                            ;CHK FOR ERROR 22
5182  025222  127727  155204  000026  66$:    CMPB    @BSEL6,#22.     ;CHK FOR ERROR 22
5183  025230  001006                  BNE     68$             ;BR IF NOT
5184                            ;REPORT RDA NOT SET
5185  025232                          GEDF    EM75,ERR12
5186                                                        ;       "DEVICE FATAL" ERROR # 61
5187  025232  104455                                                  TRAP    C$ERDF
5188  025234  000075                                                  .WORD   61
5189  025236  015035                                                  .WORD   EM75
5190  025240  020714                                                  .WORD   ERR12
5191  025242                          ESCAPE  TST
5192  025242  104410                                                  TRAP    C$ESCAPE
5193  025244  000142                                                  .WORD   L10021-.
5194                            ;CHK FOR ERROR 23
5195  025246  127727  155160  000027  68$:    CMPB    @BSEL6,#23.     ;CHK FOR ERROR 23
5196  025254  001017                  BNE     70$             ;BR IF NOT
5197                            ;REPORT RCV'D DATA MISCOMPARE ERROR
5198  025256  012737  000000  002336          MOV     #0,REGNUM       ;SET REG NO. FOR PRINTOUT
5199  025264  112737  000034  002324          MOVB    #034,GDATA      ;SET EXPECTED DATA
```

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 5200  025272  117737  155136  002326          MOVB    @BSEL7,BDATA    ;SET ACTUAL DATA
 5201  025300                                  GEDF    EM34,ERR10
 5202                                                  ;       "DEVICE FATAL" ERROR # 62
 5203  025300  104455                                                         TRAP    C$ERDF
 5204  025302  000076                                                         .WORD   62
 5205  025304  014502                                                         .WORD   EM34
 5206  025306  020364                                                         .WORD   ERR10
 5207  025310                                  ESCAPE  TST
 5208  025310  104410                                                         TRAP    C$ESCAPE
 5209  025312  000074                                                         .WORD   L10021-.
 5210                          ;CHK FOR ERROR 24
 5211  025314  127727  155112  000030  70$:    CMPB    @BSEL6,#24.     ;CHK FOR ERROR 24
 5212  025322  001006                  BNE     72$             ;BR IF NOT
 5213                          ;REPORT RDA NOT SET
 5214  025324                          GEDF    EM75,ERR12
 5215                                                  ;       "DEVICE FATAL" ERROR # 63
 5216  025324  104455                                                         TRAP    C$ERDF
 5217  025326  000077                                                         .WORD   63
 5218  025330  015035                                                         .WORD   EM75
 5219  025332  020714                                                         .WORD   ERR12
 5220  025334                                  ESCAPE  TST
 5221  025334  104410                                                         TRAP    C$ESCAPE
 5222  025336  000050                                                         .WORD   L10021-.
 5223                          ;CHK FOR ERROR 25
 5224  025340  127727  155066  000031  72$:    CMPB    @BSEL6,#25.     ;CHK FOR ERROR 25
 5225  025346  001011                  BNE     74$             ;BR IF NOT
 5226                          ;REPORT CARRIER NOT CLEARED
 5227  025350  012737  000001  002336          MOV     #1,REGNUM       ;SET REG NO. FOR PRINTOUT
 5228  025356                          GEDF    EM81,ERR14
 5229                                                  ;       "DEVICE FATAL" ERROR # 64
 5230  025356  104455                                                         TRAP    C$ERDF
 5231  025360  000100                                                         .WORD   64
 5232  025362  015201                                                         .WORD   EM81
 5233  025364  021146                                                         .WORD   ERR14
 5234  025366                                  ESCAPE  TST
 5235  025366  104410                                                         TRAP    C$ESCAPE
 5236  025370  000016                                                         .WORD   L10021-.
 5237  025372  004737  004166          74$:    JSR     PC,GETWSR       ;GET CSR'S FOR PRINTOUT
 5238                          ;REPORT INVALID ERROR CODE FROM 6502
 5239  025376                          GEDF    EM82,ERR3
 5240                                                  ;       "DEVICE FATAL" ERROR # 65
 5241  025376  104455                                                         TRAP    C$ERDF
 5242  025400  000101                                                         .WORD   65
 5243  025402  015225                                                         .WORD   EM82
 5244  025404  020072                                                         .WORD   ERR3
 5245
 5246  025406                  90$:
 5247  025406                  ENDTST
 5248  025406                                                          L10021:
 5249  025406  104401                                                         TRAP    C$ETST
```

```
5250  025410                    MCODE:
5251                            ;
5252                            ;LINE# LOC   CODE        LINE
5253                            ;
5254                            ;0001  0000                    *=$0200                 ;START OF MICROCODE FOR INTEGRAL
5255                            ;0002  0200
5256                            ;0003  C200
5257                            ;0005  0200
5258                            ;0006  0200  ;*************************************************************************
5259                            ;0007  0200  ; THIS IS THE 6502 MICROCODE WHICH IS LOADED INTO RAM AND EXECUTED FOR THE
5260                            ;0008  0200  ; PURPOSE OF TESTING THE INTEGRAL MODEM ON THE M8064, AT 56K BAUD. AFTER TH
5261                            ;0009  0200  ; LSI-11 PROGRAM DOES SOME INITIAL SETUP, IT TRANSFERS CONTROL TO THIS CODE
5262                            ;0010  0200  ; IN RAM, AND WAITS FOR COMPLETION OF THE TEST, AS INDICATED BY MRDY SET.
5263                            ;0011  0200  ; THIS CODE TRANSMITS, RECEIVES, AND CHECKS THE FOLLOWING CHARACTERS :
5264                            ;0012  0200  ; 2 SYNCH CHARACTERS, 5 DATA CHARACTERS 000, 125, 252, 377, 000, 2 CRC-16
5265                            ;0013  0200  ; CHARACTERS 160 AND 034, AND 2 TERMINATING SYNCHS. THE MESSAGE IS SENT USI
5266                            ;0014  0200  ; CHARACTER (DDCMP) MODE, THE SYNCH CHARACTER USED IS 226, STRIP SYNCH AND
5267                            ;0015  0200  ; IDLE MODES ARE SET, AND THE DATA CLOCK IS PROVIDED BY THE INTEGRAL MODEM.
5268                            ;0016  0200  ; ALL DATA AND CRC CHARACTERS ARE CHECKED AS THEY ARE RECEIVED, AND THE CRC
5269                            ;0017  0200  ; ERROR CHECK BIT IS CHECKED TO BE SET WITH RECEPTION OF THE LAST DATA
5270                            ;0018  0200  ; CHARACTER (000).
5271                            ;0019  0200  ;*************************************************************************
5272                            ;0020  0200
5273                            ;0021  0200              ;EQUATES FOR BIT DEFINITIONS
5274                            ;0022  0200          BIT0    =01
5275                            ;0023  0200          BIT1    =02
5276                            ;0024  0200          BIT2    =04
5277                            ;0025  0200          BIT3    =010
5278                            ;0026  0200          BIT4    =020
5279                            ;0027  0200          BIT5    =040
5280                            ;0028  0200          BIT6    =0100
5281                            ;0029  0200          BIT7    =0200
5282                            ;0030  0200          BIT8    =0400
5283                            ;0031  0200          BIT9    =01000
5284                            ;0032  0200          BIT10   =02000
5285                            ;0033  0200          BIT11   =04000
5286                            ;0034  0200          BIT12   =010000
5287                            ;0035  0200          BIT13   =020000
5288                            ;0036  0200          BIT14   =040000
5289                            ;0037  0200          BIT15   =0100000
5290                            ;0038  0200
5291                            ;0039  0200
5292                            ;0040  0200
5293                            ;0041  0200           ;ADDRESS EQUATES FOR CSR REGISTERS
5294                            ;0042  0200          SEL0    =$10
5295                            ;0043  0200          BSEL0   =SEL0
5296                            ;0044  0200          BSEL1   =SEL0+1
5297                            ;0045  0200          SEL2    =SEL0+2
5298                            ;0046  0200          BSEL2   =SEL0+2
5299                            ;0047  0200          BSEL3   =SEL0+3
5300                            ;0048  0200          SEL4    =SEL0+4
5301                            ;0049  0200          BSEL4   =SEL0+4
5302                            ;0050  0200          BSEL5   =SEL0+5
5303                            ;0051  0200          SEL6    =SEL0+6
5304                            ;0052  0200          BSEL6   =SEL0+6
5305                            ;0053  0200          BSEL7   =SEL0+7
```

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5306                            ;0054  0200
5307                            ;0055  0200
5308                            ;0056  0200
5309                            ;0057  0200          ;VERSATILE INTERFACE ADAPTER REGISTER EQUATES
5310                            ;0058  0200  OREGB  = $A000                    ;OUTPUT REGISTER B
5311                            ;0059  0200  OREGA  = OREGB+1                  ;OUTPUT REGISTER A
5312                            ;0060  0200  DDRB   = OREGB+2                  ;DATA DIRECTION REGISTER B
5313                            ;0061  0200  DDRA   = OREGB+3                  ;DATA DIRECTION REGISTER A
5314                            ;0062  0200  T1LL   = OREGB+6                  ;TIMER 1 LATCH LOW BITS
5315                            ;0063  0200  T1LH   = OREGB+7                  ;TIMER 1 LATCH HIGH BITS
5316                            ;0064  0200  ACR    = OREGB+$B                 ;AUXILIARY CONTROL REGISTER
5317                            ;0065  0200  PCR    = OREGB+$C                 ;PERIPHERAL CONTROL REGISTER
5318                            ;0066  0200
5319                            ;0067  0200
5320                            ;0068  0200
5321                            ;0069  0200          ;VIA OUTPUT REGISTER B BIT EQUATES
5322                            ;0070  0200  NULCLK = BIT7
5323                            ;0071  0200  RXEN   = BIT6
5324                            ;0072  0200  TXEN   = BIT5
5325                            ;0073  0200  DTR    = BIT4
5326                            ;0074  0200  RTSND  = BIT3
5327                            ;0075  0200  HDX    = BIT2
5328                            ;0076  0200  TTLOOP = BIT1
5329                            ;0077  0200  PRESET = BIT0
5330                            ;0078  0200
5331                            ;0079  0200
5332                            ;0080  0200
5333                            ;0081  0200          ;VIA OUTPUT REGISTER A BIT EQUATES
5334                            ;0082  0200  RING   = BIT7
5335                            ;0083  0200  CARIER = BIT6
5336                            ;0084  0200  MDMRDY = BIT5
5337                            ;0085  0200  BDRATE = BIT4
5338                            ;0086  0200  CTS    = BIT3
5339                            ;0087  0200  TM     = BIT2
5340                            ;0088  0200  RCVDAT = BIT1
5341                            ;0089  0200  UMAINT = BIT0
5342                            ;0090  0200
5343                            ;0091  0200
5344                            ;0092  0200          ;USYRT REGISTER ADDRESS EQUATES
5345                            ;0093  0200  RXDB   = $A100
5346                            ;0094  0200  RDSR   = RXDB+1
5347                            ;0095  0200  TXDB   = RXDB+2
5348                            ;0096  0200  TDSR   = RXDB+3
5349                            ;0097  0200  SAR    = RXDB+4
5350                            ;0098  0200  PCSAR  = RXDB+5
5351                            ;0099  0200  PCTLR  = RXDB+7
5352                            ;0100  0200
5353                            ;0101  0200
5354                            ;0102  0200
5355                            ;0103  0200          ;USYRT TDSR REGISTER BIT EQUATES
5356                            ;0104  0200  TEOM   = BIT1
5357                            ;0105  0200  TSOM   = BIT0
5358                            ;0106  0200
5359                            ;0107  0200
5360                            ;0108  0200
5361                            ;0109  0200          ;USYRT RDSR BIT EQUATES
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5362                                    ;0110  0200                RERR   = BIT7
5363                                    ;0111  0200
5364                                    ;0112  0200
5365                                    ;0113  0200
5366                                    ;0114  0200                 ;USYRT STATUS REGISTER EQUATES
5367                                    ;0115  0200                USTATR = $A400
5368                                    ;0116  0200                RDA    = BIT7
5369                                    ;0117  0200                TBMT   = BIT6
5370                                    ;0118  0200                RXACT  = BIT5
5371                                    ;0119  0200                RSA    = BIT4
5372                                    ;0120  0200                TSO    = BIT3
5373                                    ;0121  0200                TXACT  = BIT2
5374                                    ;0122  020C                TXUERR = BIT1
5375                                    ;0123  0200                SYNFLG = BIT0
5376                                    ;0124  0200
5377                                    ;0125  0200
5378                                    ;0126  0200
5379                                    ;0127  0200                 ;MISCELLANEOUS EQUATES
5380                                    ;0128  0200                SYNCH  = 8226
5381                                    ;0129  0200
5382                                    ;0130  0200
5383                                    ;0131  0200  A0 00                LDY     #0
5384  025410    240    000                      .BYTE   240,000
5385                                    ;0132  0202  84 16                STY     BSEL6           ;CLEAR BSEL6
5386  025412    204    026                      .BYTE   204,026
5387                                    ;0133  0204  84 17                STY     BSEL7           ;CLEAR BSEL7
5388  025414    204    027                      .BYTE   204,027
5389                                    ;0134  0206                ;TURN ON THE USYRT, CLOCK
5390                                    ;0135  0206  A2 60                LDX     #TXEN!RXEN      ;ASSERT TXEN,RXEN,RTS,DTR
5391  025416    242    140                      .BYTE   242,140
5392                                    ;0136  0208  8E 00 A0             STX     OREGB             ;  AND RELEASE INT MODEM RESET
5393  025420    216    000    240               .BYTE   216,000,240
5394                                    ;0137  0208  A2 00                LDX     #0              ;INIT TBMT TIME-OUT COUNTER
5395  025423    242    000                      .BYTE   242,000
5396                                    ;0138  020D  2C 00 A4             BIT     USTATR          ;SEE IF TBMT SET
5397  025425    054    000    244               .BYTE   054,000,244
5398                                    ;0139  0210  70 08                BVS     *+10            ;BR IF TBMT SET
5399  025430    160    010                      .BYTE   160,010
5400                                    ;0140  0212  E8                   INX                     ;INCREMENT TIME-OUT COUNTER
5401  025432    350                              .BYTE   350
5402                                    ;0141  0213  D0 F8                BNE     *-6             ;BR IF NO TIME-OUT
5403  025433    320    370                      .BYTE   320,370
5404                                    ;0142  0215                ; *** ERROR 1 ***
5405                                    ;0143  0215  A0 01                LDY     #1              ;SET CODE FOR TBMT TIME-OUT ERRO
5406  025435    240    001                      .BYTE   240,001
5407                                    ;0144  0217  4C 90 03             JMP     A100            ;GO TAKE ERROR EXIT
5408  025437    114    220    003               .BYTE   114,220,003
5409                                    ;0145  021A                ;LOAD FIRST SYNCH CHAR INTO TRANSMITTER
5410                                    ;0146  021A  A2 96                LDX     #SYNCH          ;LOAD FIRST SYNCH CHAR
5411  025442    242    226                      .BYTE   242,226
5412                                    ;0147  021C  8E 02 A1             STX     TXDB
5413  025444    216    002    241               .BYTE   216,002,241
5414                                    ;0148  021F  A2 00                LDX     #0              ;INIT TBMT TIME-OUT COUNTER
5415  025447    242    000                      .BYTE   242,000
5416                                    ;0149  0221  2C 00 A4             BIT     USTATR          ;SEE IF TBMT SET
5417  025451    054    000    244               .BYTE   054,000,244
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5418                                    ;0150  0224  70 08          BVS     .+10            ;BR IF TBMT SET
5419  025454    160     010                     .BYTE   160,010
5420                                    ;0151  0226  E8              INX                     ;INCREMENT TIME-OUT COUNTER
5421  025456    350                             .BYTE   350
5422                                    ;0152  0227  D0 F8          BNE     .-6             ;BR IF NO TIME-OUT
5423  025457    320     370                     .BYTE   320,370
5424                                    ;0153  0229                  ; *** ERROR 2 ***
5425                                    ;0154  0229  A0 02           LDY     #2              ;SET CODE FOR TBMT TIME-OUT ERRO
5426  025461    240     002                     .BYTE   240,002
5427                                    ;0155  022B  4C 90 03        JMP     A100            ;GO TAKE ERROR EXIT
5428  025463    114     220     003             .BYTE   114,220,003
5429                                    ;0156  022E                  ;LOAD SECOND SYNCH CHAR INTO TRANSMITTER
5430                                    ;0157  022E  A2 96           LDX     #SYNCH          ;LOAD SECOND SYNCH CHAR
5431  025466    242     226                     .BYTE   242,226
5432                                    ;0158  0230  8E 02 A1        STX     TXDB
5433  025470    216     002     241             .BYTE   216,002,241
5434                                    ;0159  0233  A2 00           LDX     #0              ;INIT TBMT TIME-OUT COUNTER
5435  025473    242     000                     .BYTE   242,000
5436                                    ;0160  0235  2C 00 A4        BIT     USTATR          ;SEE IF TBMT SET
5437  025475    054     000     244             .BYTE   054,000,244
5438                                    ;0161  0238  70 08          BVS     .+10            ;BR IF TBMT SET
5439  025500    160     010                     .BYTE   160,010
5440                                    ;0162  023A  E8              INX                     ;INCREMENT TIME-OUT COUNTER
5441  025502    350                             .BYTE   350
5442                                    ;0163  023B  D0 F8          BNE     .-6             ;BR IF NO TIME-OUT
5443  025503    320     370                     .BYTE   320,370
5444                                    ;0164  023D                  ; *** ERROR 3 ***
5445                                    ;0165  023D  A0 03           LDY     #3              ;SET CODE FOR TBMT TIME-OUT ERRO
5446  025505    240     003                     .BYTE   240,003
5447                                    ;0166  023F  4C 90 03        JMP     A100            ;GO TAKE ERROR EXIT
5448  025507    114     220     003             .BYTE   114,220,003
5449                                    ;0167  0242                  ;CHECK FOR CARRIER SET
5450                                    ;0168  0242  2C 01 A0        BIT     OREGA           ;SEE IF CARRIER SET YET
5451  025512    054     001     240             .BYTE   054,001,240
5452                                    ;0169  0245  70 05          BVS     .+7             ;BR IF CARRIER SET
5453  025515    160     005                     .BYTE   160,005
5454                                    ;0170  0247                  ; *** ERROR 4 ***
5455                                    ;0171  0247  A0 04           LDY     #4              ;SET CODE FOR CARRIER NOT SET ER
5456  025517    240     004                     .BYTE   240,004
5457                                    ;0172  0249  4C 90 03        JMP     A100            ;GO TAKE ERROR EXIT
5458  025521    114     220     003             .BYTE   114,220,003
5459                                    ;0173  024C                  ;LOAD TRANSMITTER WITH 000 CHAR
5460                                    ;0174  024C  A2 00           LDX     #000            ;CLEAR TSOM
5461  025524    242     000                     .BYTE   242,000
5462                                    ;0175  024E  8E 03 A1        STX     TDSR
5463  025526    216     003     241             .BYTE   216,003,241
5464                                    ;0176  0251  8E 02 A1        STX     TXDB            ;LOAD 000 CHAR
5465  025531    216     002     241             .BYTE   216,002,241
5466                                    ;0177  0254  A2 00           LDX     #0              ;INIT TBMT TIME-OUT COUNTER
5467  025534    242     000                     .BYTE   242,000
5468                                    ;0178  0256  2C 00 A4        BIT     USTATR          ;SEE IF TBMT SET
5469  025536    054     000     244             .BYTE   054,000,244
5470                                    ;0179  0259  70 08          BVS     .+10            ;BR IF TBMT SET
5471  025541    160     010                     .BYTE   160,010
5472                                    ;0180  025B  E8              INX                     ;INCREMENT TIME-OUT COUNTER
5473  025543    350                             .BYTE   350
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5474                                    ;0181  025C  D0 F8              BNE     *-6             ;BR IF NO TIME-OUT
5475  025544    320     370                     .BYTE   320,370
5476                                    ;0182  025E                  ; *** ERROR 5 ***
5477                                    ;0183  025E  A0 05              LDY     #5              ;SET CODE FOR TBMT TIME-OUT ERRO
5478  025546    240     005                     .BYTE   240,005
5479                                    ;0184  0260  4C 90 03           JMP     A100            ;GO TAKE ERROR EXIT
5480  025550    114     220     003             .BYTE   114,220,003
5481                                    ;0185  0263                  ;LOAD TRANSMITTER WITH 125 CHAR
5482                                    ;0186  0263  A2 55              LDX     #0125           ;LOAD 125 CHAR
5483  025553    242     125                     .BYTE   242,125
5484                                    ;0187  0265  8E 02 A1           STX     TXDB
5485  025555    216     002     241             .BYTE   216,002,241
5486                                    ;0188  0268  A2 00              LDX     #0              ;INIT TBMT TIME-OUT COUNTER
5487  025560    242     000                     .BYTE   242,000
5488                                    ;0189  026A  2C 00 A4           BIT     USTATR          ;SEE IF TBMT SET
5489  025562    054     000     244             .BYTE   054,000,244
5490                                    ;0190  026D  70 08              BVS     *+10            ;BR IF TBMT SET
5491  025565    160     010                     .BYTE   160,010
5492                                    ;0191  026F  E8                 INX                     ;INCREMENT TIME-OUT COUNTER
5493  025567    350                             .BYTE   350
5494                                    ;0192  0270  D0 F8              BNE     *-6             ;BR IF NO TIME-OUT
5495  025570    320     370                     .BYTE   320,370
5496                                    ;0193  0272                  ; *** ERROR 6 ***
5497                                    ;0194  0272  A0 06              LDY     #6              ;SET CODE FOR TBMT TIME-OUT ERRO
5498  025572    240     006                     .BYTE   240,006
5499                                    ;0195  0274  4C 90 03           JMP     A100            ;GO TAKE ERROR EXIT
5500  025574    114     220     003             .BYTE   114,220,003
5501                                    ;0196  0277                  ;LOAD TRANSMITTER WITH 252 CHAR
5502                                    ;0197  0277  A2 AA              LDX     #0252           ;LOAD 252 CHAR
5503  025577    242     252                     .BYTE   242,252
5504                                    ;0198  0279  8E 02 A1           STX     TXDB
5505  025601    216     002     241             .BYTE   216,002,241
5506                                    ;0199  027C  A2 00              LDX     #0              ;INIT TBMT TIME-OUT COUNTER
5507  025604    242     000                     .BYTE   242,000
5508                                    ;0200  027E  2C 00 A4           BIT     USTATR          ;SEE IF TBMT SET
5509  025606    054     000     244             .BYTE   054,000,244
5510                                    ;0201  0281  70 08              BVS     *+10            ;BR IF TBMT SET
5511  025611    160     010                     .BYTE   160,010
5512                                    ;0202  0283  E8                 INX                     ;INCREMENT TIME-OUT COUNTER
5513  025613    350                             .BYTE   350
5514                                    ;0203  0284  D0 F8              BNE     *-6             ;BR IF NO TIME-OUT
5515  025614    320     370                     .BYTE   320,370
5516                                    ;0204  0286                  ; *** ERROR 7 ***
5517                                    ;0205  0286  A0 07              LDY     #7              ;SET CODE FOR TBMT TIME-OUT ERRO
5518  025616    240     007                     .BYTE   240,007
5519                                    ;0206  0288  4C 90 03           JMP     A100            ;GO TAKE ERROR EXIT
5520  025620    114     220     003             .BYTE   114,220,003
5521                                    ;0207  0288                  ;LOAD TRANSMITTER WITH 377 CHAR AND END OF MESSAGE
5522                                    ;0208  0288  A2 FF              LDX     #0377           ;LOAD 377 CHAR
5523  025623    242     377                     .BYTE   242,377
5524                                    ;0209  028D  8E 02 A1           STX     TXDB
5525  025625    216     002     241             .BYTE   216,002,241
5526                                    ;0210  0290  A2 00              LDX     #0              ;INIT TBMT TIME-OUT COUNTER
5527  025630    242     000                     .BYTE   242,000
5528                                    ;0211  0292  2C 00 A4           BIT     USTATR          ;SEE IF TBMT SET
5529  025632    054     000     244             .BYTE   054,000,244
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5530                                    ;0212  0295  70 08          BVS     .+10            ;BR IF TBMT SET
5531  025635    160     010                     .BYTE   160,010
5532                                    ;0213  0297  E8              INX                     ;INCREMENT TIME-OUT COUNTER
5533  025637    350                             .BYTE   350
5534                                    ;0214  0298  D0 F8          BNE     .-6             ;BR IF NO TIME-OUT
5535  025640    320     370                     .BYTE   320,370
5536                                    ;0215  029A                  ; *** ERROR 8 ***
5537                                    ;0216  029A  A0 08           LDY     #8              ;SET CODE FOR TBMT TIME-OUT ERRO
5538  025642    240     010                     .BYTE   240,010
5539                                    ;0217  029C  4C 90 03        JMP     A100            ;GO TAKE ERROR EXIT
5540  025644    114     220     003             .BYTE   114,220,003
5541                                    ;0218  029F                  ;LOAD TRANSMITTER WITH 000 CHAR
5542                                    ;0219  029F  A2 00           LDX     #000            ;LOAD 000 CHAR
5543  025647    242     000                     .BYTE   242,000
5544                                    ;0220  02A1  8E 02 A1        STX     TXDB
5545  025651    216     002     241             .BYTE   216,002,241
5546                                    ;0221  02A4  A2 00           LDX     #0              ;INIT RDA TIME-OUT COUNTER
5547  025654    242     000                     .BYTE   242,000
5548                                    ;0222  02A6  2C 00 A4        BIT     USTATR          ;SEE IF RDA SET
5549  025656    054     000     244             .BYTE   054,000,244
5550                                    ;0223  02A9  30 08           BMI     .+10            ;BR IF RDA SET
5551  025661    060     010                     .BYTE   060,010
5552                                    ;0224  02AB  E8              INX                     ;INCREMENT TIME-OUT COUNTER
5553  025663    350                             .BYTE   350
5554                                    ;0225  02AC  D0 F8          BNE     .-6             ;BR IF NO TIME-OUT
5555  025664    320     370                     .BYTE   320,370
5556                                    ;0226  02AE                  ; *** ERROR 9 ***
5557                                    ;0227  02AE  A0 09           LDY     #9              ;SET CODE FOR RDA TIME-OUT ERROR
5558  025666    240     011                     .BYTE   240,011
5559                                    ;0228  02B0  4C 90 03        JMP     A100            ;GO TAKE ERROR EXIT
5560  025670    114     220     003             .BYTE   114,220,003
5561                                    ;0229  02B3                  ;READ AND CHECK 000 CHAR
5562                                    ;0230  02B3  AD 00 A1        LDA     RXDB            ;READ RECEIVER BUFFER
5563  025673    255     000     241             .BYTE   255,000,241
5564                                    ;0231  02B6  C9 00           CMP     #8000           ;CHK FOR 000
5565  025676    311     000                     .BYTE   311,000
5566                                    ;0232  02B8  F0 05           BEQ     .+7             ;BR IF 000
5567  025700    360     005                     .BYTE   360,005
5568                                    ;0233  02BA                  ; *** ERROR 10 ***
5569                                    ;0234  02BA  A0 0A           LDY     #10             ;SET CODE FOR DATA MISCOMPARE ER
5570  025702    240     012                     .BYTE   240,012
5571                                    ;0235  02BC  4C 90 03        JMP     A100            ;GO TAKE ERROR EXIT
5572  025704    114     220     003             .BYTE   114,220,003
5573                                    ;0236  02BF  A2 00           LDX     #0              ;INIT RDA TIME-OUT COUNTER
5574  025707    242     000                     .BYTE   242,000
5575                                    ;0237  02C1  2C 00 A4        BIT     USTATR          ;SEE IF RDA SET
5576  025711    054     000     244             .BYTE   054,000,244
5577                                    ;0238  02C4  30 08           BMI     .+10            ;BR IF RDA SET
5578  025714    060     010                     .BYTE   060,010
5579                                    ;0239  02C6  E8              INX                     ;INCREMENT TIME-OUT COUNTER
5580  025716    350                             .BYTE   350
5581                                    ;0240  02C7  D0 F8          BNE     .-6             ;BR IF NO TIME-OUT
5582  025717    320     370                     .BYTE   320,370
5583                                    ;0241  02C9                  ; *** ERROR 11 ***
5584                                    ;0242  02C9  A0 0B           LDY     #11             ;SET CODE FOR RDA TIME-OUT ERROR
5585  025721    240     013                     .BYTE   240,013
```

```
5586                                    ;0243  02CB  4C 90 03          JMP     A100            ;GO TAKE ERROR EXIT
5587  025723    114     220     003             .BYTE   114,220,003
5588                                    ;0244  02CE  A2 02             LDX     #TEOM           ;SET TEOM TO TERMINATE MSG
5589  025726    242     002             .BYTE   242,002
5590                                    ;0245  02D0  8E 03 A1          STX     TDSR
5591  025730    216     003     241             .BYTE   216,003,241
5592                                    ;0246  02D3                    ;READ AND CHECK 125 CHAR
5593                                    ;0247  02D3  AD 00 A1          LDA     RXDB            ;READ RECEIVER BUFFER
5594  025733    255     000     241             .BYTE   255,000,241
5595                                    ;0248  02D6  C9 55             CMP     #0125           ;CHK FOR 125
5596  025736    311     125             .BYTE   311,125
5597                                    ;0249  02D8  F0 05             BEQ     .+7             ;BR IF 125
5598  025740    360     005             .BYTE   360,005
5599                                    ;0250  02DA                    ; *** ERROR 12 ***
5600                                    ;0251  02DA  A0 0C             LDY     #12             ;SET CODE FOR DATA MISCOMPARE ER
5601  025742    240     014             .BYTE   240,014
5602                                    ;0252  02DC  4C 90 03          JMP     A100            ;GO TAKE ERROR EXIT
5603  025744    114     220     003             .BYTE   114,220,003
5604                                    ;0253  02DF  A2 00             LDX     #0              ;INIT RDA TIME-OUT COUNTER
5605  025747    242     000             .BYTE   242,000
5606                                    ;0254  02E1  2C 00 A4          BIT     USTATR          ;SEE IF RDA SET
5607  025751    054     000     244             .BYTE   054,000,244
5608                                    ;0255  02E4  30 08             BMI     .+10            ;BR IF RDA SET
5609  025754    060     010             .BYTE   060,010
5610                                    ;0256  02E6  E8                INX                     ;INCREMENT TIME-OUT COUNTER
5611  025756    350                     .BYTE   350
5612                                    ;0257  02E7  D0 F8             BNE     .-6             ;BR IF NO TIME-OUT
5613  025757    320     370             .BYTE   320,370
5614                                    ;0258  02E9                    ; *** ERROR 13 ***
5615                                    ;0259  02E9  A0 0D             LDY     #13             ;SET CODE FOR RDA TIME-OUT ERROR
5616  025761    240     015             .BYTE   240,015
5617                                    ;0260  02EB  4C 90 03          JMP     A100            ;GO TAKE ERROR EXIT
5618  025763    114     220     003             .BYTE   114,220,003
5619                                    ;0261  02EE                    ;READ AND CHECK 252 CHAR
5620                                    ;0262  02EE  AD 00 A1          LDA     RXDB            ;READ RECEIVER BUFFER
5621  025766    255     000     241             .BYTE   255,000,241
5622                                    ;0263  02F1  C9 AA             CMP     #0252           ;CHK FOR 252
5623  025771    311     252             .BYTE   311,252
5624                                    ;0264  02F3  F0 05             BEQ     .+7             ;BR IF 252
5625  025773    360     005             .BYTE   360,005
5626                                    ;0265  02F5                    ; *** ERROR 14 ***
5627                                    ;0266  02F5  A0 0E             LDY     #14             ;SET CODE FOR DATA MISCOMPARE ER
5628  025775    240     016             .BYTE   240,016
5629                                    ;0267  02F7  4C 90 03          JMP     A100            ;GO TAKE ERROR EXIT
5630  025777    114     220     003             .BYTE   114,220,003
5631                                    ;0268  02FA  A2 00             LDX     #0              ;INIT RDA TIME-OUT COUNTER
5632  026002    242     000             .BYTE   242,000
5633                                    ;0269  02FC  2C 00 A4          BIT     USTATR          ;SEE IF RDA SET
5634  026004    054     000     244             .BYTE   054,000,244
5635                                    ;0270  02FF  30 08             BMI     .+10            ;BR IF RDA SET
5636  026007    060     010             .BYTE   060,010
5637                                    ;0271  0301  E8                INX                     ;INCREMENT TIME-OUT COUNTER
5638  026011    350                     .BYTE   350
5639                                    ;0272  0302  D0 F8             BNE     .-6             ;BR IF NO TIME-OUT
5640  026012    320     370             .BYTE   320,370
5641                                    ;0273  0304                    ; *** ERROR 15 ***
```

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5642                                    ;0274  0304  A0 0F              LDY     #15             ;SET CODE FOR RDA TIME-OUT ERROR
5643  026014    240     017                     .BYTE   240,017
5644                                    ;0275  0306  4C 90 03           JMP     A100            ;GO TAKE ERROR EXIT
5645  026016    114     220     003             .BYTE   114,220,003
5646                                    ;0276  0309                    ;READ AND CHECK 377 CHAR
5647                                    ;0277  0309  AD 00 A1           LDA     RXDB            ;READ RECEIVER BUFFER
5648  026021    255     000     241             .BYTE   255,000,241
5649                                    ;0278  030C  C9 FF              CMP     #0377           ;CHK FOR 377
5650  026024    311     377                     .BYTE   311,377
5651                                    ;0279  030E  F0 05              BEQ     .+7             ;BR IF 377
5652  026026    360     005                     .BYTE   360,005
5653                                    ;0280  0310                    ; *** ERROR 16 ***
5654                                    ;0281  0310  A0 10              LDY     #16             ;SET CODE FOR DATA MISCOMPARE ER
5655  026030    240     020                     .BYTE   240,020
5656                                    ;0282  0312  4C 90 03           JMP     A100            ;GO TAKE ERROR EXIT
5657  026032    114     220     003             .BYTE   114,220,003
5658                                    ;0283  0315  A2 00              LDX     #0              ;INIT RDA TIME-OUT COUNTER
5659  026035    242     000                     .BYTE   242,000
5660                                    ;0284  0317  2C 00 A4           BIT     USTATR          ;SEE IF RDA SET
5661  026037    054     000     244             .BYTE   054,000,244
5662                                    ;0285  031A  30 08              BMI     .+10            ;BR IF RDA SET
5663  026042    060     010                     .BYTE   060,010
5664                                    ;0286  031C  E8                 INX                     ;INCREMENT TIME-OUT COUNTER
5665  026044    350                             .BYTE   350
5666                                    ;0287  031D  D0 F8              BNE     .-6             ;BR IF NO TIME-OUT
5667  026045    320     370                     .BYTE   320,370
5668                                    ;0288  031F                    ; *** ERROR 17 ***
5669                                    ;0289  031F  A0 11              LDY     #17             ;SET CODE FOR RDA TIME-OUT ERROR
5670  026047    240     021                     .BYTE   240,021
5671                                    ;0290  0321  4C 90 03           JMP     A100            ;GO TAKE ERROR EXIT
5672  026051    114     220     003             .BYTE   114,220,003
5673                                    ;0291  0324                    ;READ AND CHECK 000 CHAR
5674                                    ;0292  0324  AD 00 A1           LDA     RXDB            ;READ RECEIVER BUFFER
5675  026054    255     000     241             .BYTE   255,000,241
5676                                    ;0293  0327  C9 00              CMP     #0000           ;CHK FOR 000
5677  026057    311     000                     .BYTE   311,000
5678                                    ;0294  0329  F0 05              BEQ     .+7             ;BR IF 000
5679  026061    360     005                     .BYTE   360,005
5680                                    ;0295  032B                    ; *** ERROR 18 ***
5681                                    ;0296  032B  A0 12              LDY     #18             ;SET CODE FOR DATA MISCOMPARE ER
5682  026063    240     022                     .BYTE   240,022
5683                                    ;0297  032D  4C 90 03           JMP     A100            ;GO TAKE ERROR EXIT
5684  026065    114     220     003             .BYTE   114,220,003
5685                                    ;0298  0330  AE 01 A1           LDX     RDSR            ;CHECK FOR RERR BIT SET
5686  026070    256     001     241             .BYTE   256,001,241
5687                                    ;0299  0333  30 05              BMI     .+7             ;BR IF RERR BIT SET (NO CRC ERRO
5688  026073    060     005                     .BYTE   060,005
5689                                    ;0300  0335                    ; *** ERROR 19 ***
5690                                    ;0301  0335  A0 13              LDY     #19
5691  026075    240     023                     .BYTE   240,023
5692                                    ;0302  0337  4C 90 03           JMP     A100            ;GO TAKE ERROR EXIT
5693  026077    114     220     003             .BYTE   114,220,003
5694                                    ;0303  033A  A2 00              LDX     #0              ;INIT RDA TIME-OUT COUNTER
5695  026102    242     000                     .BYTE   242,000
5696                                    ;0304  033C  2C 00 A4           BIT     USTATR          ;SEE IF RDA SET
5697  026104    054     000     244             .BYTE   054,000,244
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5698                                    ;0305  033F  30 08              BMI     .+10            ;BR IF RDA SET
5699  026107      060     010                 .BYTE   060,010
5700                                    ;0306  0341  E8                  INX                     ;INCREMENT TIME-OUT COUNTER
5701  026111      350                         .BYTE   350
5702                                    ;0307  0342  D0 F8              BNE     .-6             ;BR IF NO TIME-OUT
5703  026112      320     370                 .BYTE   320,370
5704                                    ;0308  0344                  ; *** ERROR 20 ***
5705                                    ;0309  0344  A0 14              LDY     #20             ;SET CODE FOR RDA TIME-OUT ERROR
5706  026114      240     024                 .BYTE   240,024
5707                                    ;0310  0346  4C 90 03           JMP     A100            ;GO TAKE ERROR EXIT
5708  026116      114     220     003         .BYTE   114,220,003
5709                                    ;0311  0349                  ;READ AND CHECK FIRST CRC CHAR (160)
5710                                    ;0312  0349  AD 00 A1           LDA     RXDB            ;READ RECEIVER BUFFER
5711  026121      255     000     241         .BYTE   255,000,241
5712                                    ;0313  034C  C9 70              CMP     #160            ;CHK FOR 160
5713  026124      311     160                 .BYTE   311,160
5714                                    ;0314  034E  F0 05              BEQ     .+7             ;BR IF 160
5715  026126      360     005                 .BYTE   360,005
5716                                    ;0315  0350                  ; *** ERROR 21 ***
5717                                    ;0316  0350  A0 15              LDY     #21             ;SET CODE FOR DATA MISCOMPARE ER
5718  026130      240     025                 .BYTE   240,025
5719                                    ;0317  0352  4C 90 03           JMP     A100            ;GO TAKE ERROR EXIT
5720  026132      114     220     003         .BYTE   114,220,003
5721                                    ;0318  0355  A2 00              LDX     #0              ;INIT RDA TIME-OUT COUNTER
5722  026135      242     000                 .BYTE   242,000
5723                                    ;0319  0357  2C 00 A4           BIT     USTATR          ;SEE IF RDA SET
5724  026137      054     000     244         .BYTE   054,000,244
5725                                    ;0320  035A  30 08              BMI     .+10            ;BR IF RDA SET
5726  026142      060     010                 .BYTE   060,010
5727                                    ;0321  035C  E8                  INX                     ;INCREMENT TIME-OUT COUNTER
5728  026144      350                         .BYTE   350
5729                                    ;0322  035D  D0 F8              BNE     .-6             ;BR IF NO TIME-OUT
5730  026145      320     370                 .BYTE   320,370
5731                                    ;0323  035F                  ; *** ERROR 22 ***
5732                                    ;0324  035F  A0 16              LDY     #22             ;SET CODE FOR RDA TIME-OUT ERROR
5733  026147      240     026                 .BYTE   240,026
5734                                    ;0325  0361  4C 90 03           JMP     A100            ;GO TAKE ERROR EXIT
5735  026151      114     220     003         .BYTE   114,220,003
5736                                    ;0326  0364                  ;READ AND CHECK 2ND CRC CHAR (034)
5737                                    ;0327  0364  AD 00 A1           LDA     RXDB            ;READ RECEIVER BUFFER
5738  026154      255     000     241         .BYTE   255,000,241
5739                                    ;0328  0367  C9 1C              CMP     #034            ;CHK FOR 034
5740  026157      311     034                 .BYTE   311,034
5741                                    ;0329  0369  F0 05              BEQ     .+7             ;BR IF 034
5742  026161      360     005                 .BYTE   360,005
5743                                    ;0330  0368                  ; *** ERROR 23 ***
5744                                    ;0331  0368  A0 17              LDY     #23             ;SET CODE FOR DATA MISCOMPARE ER
5745  026163      240     027                 .BYTE   240,027
5746                                    ;0332  036D  4C 90 03           JMP     A100            ;GO TAKE ERROR EXIT
5747  026165      114     220     003         .BYTE   114,220,003
5748                                    ;0333  0370  A2 00              LDX     #0              ;INIT RDA TIME-OUT COUNTER
5749  026170      242     000                 .BYTE   242,000
5750                                    ;0334  0372  2C 00 A4           BIT     USTATR          ;SEE IF RDA SET
5751  026172      054     000     244         .BYTE   054,000,244
5752                                    ;0335  0375  30 08              BMI     .+10            ;BR IF RDA SET
5753  026175      060     010                 .BYTE   060,010
```

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5754                                    ;0336  0377  E8                INX                     ;INCREMENT TIME-OUT COUNTER
5755  026177    350                                .BYTE   350
5756                                    ;0337  0378  D0 F8              BNE     .-6             ;BR IF NO TIME-OUT
5757  026200    320     370                      .BYTE   320,370
5758                                    ;0338  037A                ; *** ERROR 24 ***
5759                                    ;0339  037A  A0 18              LDY     #24             ;SET CODE FOR RDA TIME-OUT ERROR
5760  026202    240     030                      .BYTE   240,030
5761                                    ;0340  037C  4C 90 03           JMP     A100            ;GO TAKE ERROR EXIT
5762  026204    114     220     003              .BYTE   114,220,003
5763                                    ;0341  037F                ;DROP RTS, CHECK FOR CARRIER TO DROP
5764                                    ;0342  037F  A2 68              LDX     #TXEN!RXEN!RTSND  ;DE-ASSERT RTS
5765  026207    242     150                      .BYTE   242,150
5766                                    ;0343  0381  8E 00 A0           STX     OREGB
5767  026211    216     000     240              .BYTE   216,000,240
5768                                    ;0344  0384  A2 00              LDX     #0              ;INIT CARRIER DROP TIME-OUT COUN
5769  026214    242     000                      .BYTE   242,000
5770                                    ;0345  0386  2C 01 A0           BIT     OREGA           ;SEE IF CARRIER CLEARED
5771  026216    054     001     240              .BYTE   054,001,240
5772                                    ;0346  0389  50 05              BVC     .+7             ;BR IF CARRIER CLEARED
5773  026221    120     005                      .BYTE   120,005
5774                                    ;0347  038B  E8                  INX                     ;INCREMENT TIME-OUT COUNTER
5775  026223    350                              .BYTE   350
5776                                    ;0348  038C  D0 F8              BNE     .-6             ;BR IF NO TIME-OUT
5777  026224    320     370                      .BYTE   320,370
5778                                    ;0349  038E                ; *** ERROR 25 ***
5779                                    ;0350  038E  A0 19              LDY     #25             ;SET CODE FOR CARRIER DROP TIME-
5780  026226    240     031                      .BYTE   240,031
5781                                    ;0351  0390                ;COME HERE FOR EXIT
5782                                    ;0352  0390  84 16          A100:  STY     BSEL6           ;PUT ERROR NO. (IF ANY) INTO BSE
5783  026230    204     026                      .BYTE   204,026
5784                                    ;0353  0392  85 17              STA     BSEL7           ;PUT BAD DATA (IF ANY) INTO BSEL
5785  026232    205     027                      .BYTE   205,027
5786                                    ;0354  0394  60                  RTS                     ;RETURN CONTROL TO LSI-11 PROGRA
5787  026234    140                              .BYTE   140
5788                                    ;0355  0395
5789                                    ;0356  0395
5790                                    ;
5791                                    ;
5792                                    ;ERRORS = 0000
5793                                    ;
5794  026235                            ENDCOD:
5795            026236                  .EVEN
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                                .SBTTL  TEST 3 -- DATA TEST -- BCP XLB CRC-16

                                ;++*************************************************************************
                                ;*
                                ;*      TEST 3 -- DATA TEST -- BCP XLB CRC-16
                                ;*
                                ;*  IF  XLB  IS  SPECIFIED  IN  THE  P-TABLE,  THIS TEST WILL TRANSMIT &
                                ;*  RECEIVE  IN  BCP  MODE  WITH  CRC-16  ERROR  DETECTION THE FOLLOWING
                                ;*  MESSAGE:
                                ;*
                                ;*     125  252  000 377 001 002 004 010 020 040 100 200 376 375 373 367
                                ;*     357 337 277 177
                                ;*
                                ;*  THIS  MESSAGE  WILL  BE  PRECEDED  BY 3 SYNC CHARACTERS AND REPEATED
                                ;*  THREE  TIMES WITH CRC'S FOLLOWING EACH ONE. THE LAST TRANSMISSION OF
                                ;*  THE  CRC  WILL BE FOLLOWED BY SEVERAL SYNC CHARACTERS BEFORE DROPPING
                                ;*  TXE & RXE. 8-BIT CHARACTER LENGTHS ARE ALSO UTILIZED.
                                ;*
                                ;*  IF XLB WAS NOT SPECIFIED (AND/OR BOARD TYPE IS M8064), THIS TEST MAY BE RUN
                                ;*  USING INTERNAL LOOPBACK (TTLOOP=1).
                                ;*
                                ;--*************************************************************************
                                ;
                                ;       BGNTST
026236                                                                          T3::
026236  012737  000003  002526          MOV     #3,REGO         ;INIT COUNT (TEXT TRANSMITTED 3 TIMES)
026244  004737  005376                  JSR     PC,INIDMV       ;INIT DMV-11, ENTER MAINT LOOP
026250  042737  001000  026326          BIC     #NOLOOP,1$      ;
026256  012737  000011  027100          MOV     #9.,3$          ;*INIT ENTRAN COUNT/TTLOOP STATUS
026264  023727  002470  000000          CMP     BRDTYP,#0       ;IS THIS AN M8064?
026272  001412                          BEQ     2$              ; YES: USE TTLOOP (NOT XLB).
026274  023727  002472  000004          CMP     TSTCON,#4       ;IS A LOOPBACK CONNECTOR/CABLE SPECIFIED ?
026302  001406                          BEQ     2$              ;BR IF NO
026304  052737  001000  026326          BIS     #NOLOOP,1$      ; YES: SPECIFY NO TTLOOP (INITRN)
026312  052737  100000  027100          BIS     #BIT15,3$       ;       AND SET MSB OF ENTRAN STATUS (NOLOOP)
                                ;-----------------------------------------------------------------------
026320  004537  007234          2$:     JSR     R5,INITRN       ;LOAD 1 SOM, CLK TX UNTIL ACTIVE
026324  065626                          DDCMP!STRIPS!IDLES!CRC16!SYNCH ;SET DDCMP, STRIP,IDLE,CRC-16, SYNCH=226
026326  000000                  1$:     0                       ;USE 8 BIT CHARS
026330  103003                          BCC     .+8.            ;BR IF NO ERROR
026332                                  ERROR                   ;REPORT STACKED ERROR
026332  104460                                                                  TRAP    C$ERROR
026334                                  ESCAPE  TST             ;SKIP TO END OF TEST
026334  104410                                                                  TRAP    C$ESCAPE
026336  000554                                                                  .WORD   L10022-.

026340  004537  010136                  JSR     R5,TXCHAR       ;LOAD 2ND SYNCH, TX 1ST SYNCH
026344  000226                          SYNCH
026346  000007                          7.
026350  103003                          BCC     .+8.            ;BR IF NO ERROR
026352                                  ERROR                   ;REPORT STACKED ERROR
026352  104460                                                                  TRAP    C$ERROR
026354                                  ESCAPE  TST             ;SKIP TO END OF TEST
026354  104410                                                                  TRAP    C$ESCAPE
026356  000534                                                                  .WORD   L10022-.

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5852  026360  004537  010136          JSR     R5,TXCHAR       ;LOAD 3RD SYNCH, TX 2ND SYNCH
5853  026364  000226                  SYNCH
5854  026366  000010                  8.
5855  026370  103003                  BCC     .+8.            ;BR IF NO ERROR
5856  026372                          ERROR                   ;REPORT STACKED ERROR
5857  026372  104460                                                  TRAP    C$ERROR
5858  026374                          ESCAPE  TST             ;SKIP TO END OF TEST
5859  026374  104410                                                  TRAP    C$ESCAPE
5860  026376  000514                                                  .WORD   L10022-.
5861
5862  026400  004537  010250          JSR     R5,TXCTRL       ;CLEAR TSOM
5863  026404  000000                  000
5864  026406  000000                  0
5865
5866  026410  004537  010136          JSR     R5,TXCHAR       ;LOAD 125(DATA1), TX 3RD SYNCH
5867  026414  000125                  125
5868  026416  000010                  8.
5869  026420  103003                  BCC     .+8.            ;BR IF NO ERROR
5870  026422                          ERROR                   ;REPORT STACKED ERROR
5871  026422  104460                                                  TRAP    C$ERROR
5872  026424                          ESCAPE  TST             ;SKIP TO END OF TEST
5873  026424  104410                                                  TRAP    C$ESCAPE
5874  026426  000464                                                  .WORD   L10022-.
5875
5876  026430  004537  010136          JSR     R5,TXCHAR       ;LOAD 252(DATA2), TX 125(DATA1)
5877  026434  000252                  252
5878  026436  000010                  8.
5879  026440  103003                  BCC     .+8.            ;BR IF NO ERROR
5880  026442                          ERROR                   ;REPORT STACKED ERROR
5881  026442  104460                                                  TRAP    C$ERROR
5882  026444                          ESCAPE  TST             ;SKIP TO END OF TEST
5883  026444  104410                                                  TRAP    C$ESCAPE
5884  026446  000444                                                  .WORD   L10022-.
5885
5886  026450  004537  010136          JSR     R5,TXCHAR       ;LOAD 000(DATA3), TX 252(DATA2)
5887  026454  000000                  000
5888  026456  000010                  8.
5889  026460  103003                  BCC     .+8.            ;BR IF NO ERROR
5890  026462                          ERROR                   ;REPORT STACKED ERROR
5891  026462  104460                                                  TRAP    C$ERROR
5892  026464                          ESCAPE  TST             ;SKIP TO END OF TEST
5893  026464  104410                                                  TRAP    C$ESCAPE
5894  026466  000424                                                  .WORD   L10022-.
5895
5896  026470  004537  010136          JSR     R5,TXCHAR       ;LOAD 377(DATA4), TX 000(DATA3)
5897  026474  000377                  377
5898  026476  000010                  8.
5899  026500  103003                  BCC     .+8.            ;BR IF NO ERROR
5900  026502                          ERROR                   ;REPORT STACKED ERROR
5901  026502  104460                                                  TRAP    C$ERROR
5902  026504                          ESCAPE  TST             ;SKIP TO END OF TEST
5903  026504  104410                                                  TRAP    C$ESCAPE
5904  026506  000404                                                  .WORD   L10022-.
5905
5906  026510  004537  010136          JSR     R5,TXCHAR       ;LOAD 001(DATA5)
5907  026514  000001                  001
```

```
 5908  026516  000000                          0
 5909  026520  103003                          BCC     .+8.            ;BR IF NO ERROR
 5910  026522                                  ERROR                   ;REPORT STACKED ERROR
 5911  026522  104460                                                                  TRAP    C$ERROR
 5912  026524                                  ESCAPE  TST             ;SKIP TO END OF TEST
 5913  026524  104410                                                                  TRAP    C$ESCAPE
 5914  026526  000364                                                                  .WORD   L10022-.
 5915
 5916  026530  004537  011624                  JSR     R5,RCV1ST       ;CLOCK AND RCV 125
 5917  026534  000000                          0
 5918  026536  103003                          BCC     .+8.            ;BR IF NO ERROR
 5919  026540                                  ERROR                   ;REPORT STACKED ERROR
 5920  026540  104460                                                                  TRAP    C$ERROR
 5921  026542                                  ESCAPE  TST             ;SKIP TO END OF TEST
 5922  026542  104410                                                                  TRAP    C$ESCAPE
 5923  026544  000346                                                                  .WORD   L10022-.
 5924
 5925  026546  004537  010350                  JSR     R5,RXCHAR       ;READ & CHK 125(DATA1), RCV 252(DATA2)
 5926  026552  000125                          125
 5927  026554  000000                          0
 5928  026556  000010                          8.
 5929  026560  103003                          BCC     .+8.            ;BR IF NO ERROR
 5930  026562                                  ERROR                   ;REPORT STACKED ERROR
 5931  026562  104460                                                                  TRAP    C$ERROR
 5932  026564                                  ESCAPE  TST             ;SKIP TO END OF TEST
 5933  026564  104410                                                                  TRAP    C$ESCAPE
 5934  026566  000324                                                                  .WORD   L10022-.
 5935                          ;-----------------------------------------------------------------
 5936                          ; TRANSMIT THE BULK OF DATA OUT OF TABLE "PATX"
 5937                          ;-----------------------------------------------------------------
 5938  026570  012702  002646          MOV     #PATX+1,R2      ;SET UP TABLE POINTER
 5939  026574  112237  026632  5$:     MOVB    (R2)+,20$       ;SET UP EXPECTED CHARACTER
 5940  026600  116237  000003  026612  MOVB    3(R2),10$       ;SET UP TRANSMIT CHARACTER
 5941
 5942  026606  004537  010136          JSR     R5,TXCHAR       ;LOAD A CHARACTER
 5943  026612  000000          10$:    000                     ;** HOLE FOR NEXT TX CHARACTER
 5944  026614  000000                  0
 5945  026616  103003                  BCC     .+8.            ;BR IF NO ERROR
 5946  026620                          ERROR                   ;REPORT STACKED ERROR
 5947  026620  104460                                                          TRAP    C$ERROR
 5948  026622                          ESCAPE  TST             ;SKIP TO END OF TEST
 5949  026622  104410                                                          TRAP    C$ESCAPE
 5950  026624  000266                                                          .WORD   L10022-.
 5951
 5952  026626  004537  010350          JSR     R5,RXCHAR       ;CLK/RECEIVE/CHECK PREVIOUS CHARACTER
 5953  026632  000000          20$:    000                     ;** HOLE FOR EXPECTED CHARACTER
 5954  026634  000000                  0
 5955  026636  000010                  8.
 5956  026640  103003                  BCC     .+8.            ;BR IF NO ERROR
 5957  026642                          ERROR                   ;REPORT STACKED ERROR
 5958  026642  104460                                                          TRAP    C$ERROR
 5959  026644                          ESCAPE  TST             ;SKIP TO END OF TEST
 5960  026644  104410                                                          TRAP    C$ESCAPE
 5961  026646  000244                                                          .WORD   L10022-.
 5962
 5963  026650  022702  002665          CMP     #PATX+16.,R2    ;CHECK FOR 20TH CHARACTER OF TABLE
```

```
5964  026654  001347                    BNE     5$              ;BR IF NOT DONE
5965                                    ;-----------------------------------------------------------------
5966  026656  004537  010250            JSR     R5,TXCTRL       ;LOAD 1ST TEOM
5967  026662  000002                    TEOM
5968  026664  000000                    0
5969  026666  004537  010350            JSR     R5,RXCHAR       ;READ/CHK 357(DATA17), RCV 337(DATA18)
5970  026672  000357                    357
5971  026674  000000                    0
5972  026676  000010                    8.
5973  026700  103003                    BCC     .+8.            ;BR IF NO ERROR
5974  026702                            ERROR                   ;REPORT STACKED ERROR
5975  026702  104460                                                    TRAP    C$ERROR
5976  026704                            ESCAPE  TST             ;SKIP TO END OF TEST
5977  026704  104410                                                    TRAP    C$ESCAPE
5978  026706  000204                                                    .WORD   L10022-.
5979
5980  026710  004537  010250            JSR     R5,TXCTRL       ;LOAD 2ND TEOM
5981  026714  000002                    TEOM
5982  026716  000000                    0
5983  026720  004537  010350            JSR     R5,RXCHAR       ;READ/CHK 337(DATA18), RCV 277(DATA19)
5984  026724  000337                    337
5985  026726  000000                    0
5986  026730  000010                    8.
5987  026732  103003                    BCC     .+8.            ;BR IF NO ERROR
5988  026734                            ERROR                   ;REPORT STACKED ERROR
5989  026734  104460                                                    TRAP    C$ERROR
5990  026736                            ESCAPE  TST             ;SKIP TO END OF TEST
5991  026736  104410                                                    TRAP    C$ESCAPE
5992  026740  000152                                                    .WORD   L10022-.
5993
5994  026742  004537  010350            JSR     R5,RXCHAR       ;READ/CHK 277(DATA19), RCV 177(DATA20)
5995  026746  000277                    277
5996  026750  000000                    0
5997  026752  000010                    8.
5998  026754  103003                    BCC     .+8.            ;BR IF NO ERROR
5999  026756                            ERROR                   ;REPORT STACKED ERROR
6000  026756  104460                                                    TRAP    C$ERROR
6001  026760                            ESCAPE  TST             ;SKIP TO END OF TEST
6002  026760  104410                                                    TRAP    C$ESCAPE
6003  026762  000130                                                    .WORD   L10022-.
6004
6005  026764  004537  010350            JSR     R5,RXCHAR       ;READ/CHK 177(DATA20), RCV FIRST CRC BYTE
6006  026770  100177                    RXERR!177
6007  026772  000001                    RERCHK
6008  026774  000010                    8.
6009  026776  103003                    BCC     .+8.            ;BR IF NO ERROR
6010  027000                            ERROR                   ;REPORT STACKED ERROR
6011  027000  104460                                                    TRAP    C$ERROR
6012  027002                            ESCAPE  TST             ;SKIP TO END OF TEST
6013  027002  104410                                                    TRAP    C$ESCAPE
6014  027004  000106                                                    .WORD   L10022-.
6015
6016  027006  004537  010350            JSR     R5,RXCHAR       ;READ & CHK 1ST CRC BYTE, RCV SECOND CRC BYTE
6017  027012  000156                    156
6018  027014  000000                    0
6019  027016  000010                    8.
```

```
6020  027020  103003                    BCC     .+8.            ;BR IF NO ERROR
6021  027022                            ERROR                   ;REPORT STACKED ERROR
6022  027022  104460                                                    TRAP    C$ERROR
6023  027024                            ESCAPE  TST             ;SKIP TO END OF TEST
6024  027024  104410                                                    TRAP    C$ESCAPE
6025  027026  000064                                                    .WORD   L10022-.
6026
6027  027030  004537  010350            JSR     R5,RXCHAR       ;READ & CHK 2ND CRC BYTE, RCV 1ST SYNCH
6028  027034  000236                    236
6029  027036  000000                    0
6030  027040  000010                    8.
6031  027042  103003                    BCC     .+8.            ;BR IF NO ERROR
6032  027044                            ERROR                   ;REPORT STACKED ERROR
6033  027044  104460                                                    TRAP    C$ERROR
6034  027046                            ESCAPE  TST             ;SKIP TO END OF TEST
6035  027046  104410                                                    TRAP    C$ESCAPE
6036  027050  000042                                                    .WORD   L10022-.
6037                            ;-----------------------------------------------------------------
6038  027052  005337  002526            DEC     REGO            ;DECREMENT COUNT
6039  027056  001406                    BEQ     40$             ;BR IF TRIPLE LOOP IS COMPLETED
6040
6041  027060  004537  010250            JSR     R5,TXCTRL       ;CLEAR TEOM, SET TSOM
6042  027064  000001                    TSOM
6043  027066  000001                    1
6044  027070  000137  026320            JMP     2$              ;AND RUN TX/RX AGAIN
6045
6046  027074  004537  011772    40$:    JSR     R5,ENTRAN       ;SHUT DOWN TRANSMITTER, RECEIVER
6047  027100  000011    3$:             9.
6048  027102  103003                    BCC     .+8.            ;BR IF NO ERROR
6049  027104                            ERROR                   ;REPORT STACKED ERROR
6050  027104  104460                                                    TRAP    C$ERROR
6051  027106                            ESCAPE  TST             ;SKIP TO END OF TEST
6052  027106  104410                                                    TRAP    C$ESCAPE
6053  027110  000002                                                    .WORD   L10022-.
6054  027112            ENDTST
6055  027112                                                  L10022:
6056  027112  104401                                                    TRAP    C$ETST
```

```
                        .SBTTL  TEST 4 -- DATA TEST -- BCP XLB ODD VRC

                        ;+**********************************************************************
                        ;*
                        ;*      TEST 4 -- DATA TEST -- BCP XLB ODD VRC
                        ;*
                        ;*  IF  XLB  IS  SPECIFIED  IN  THE  P-TABLE,  THIS TEST WILL TRANSMIT &
                        ;*  RECEIVE  IN  BCP  MODE  WITH  ODD  VRC ERROR DETECTION THE FOLLOWING
                        ;*  MESSAGE:
                        ;*
                        ;*     125  252  000 377 001 002 004 010 020 040 100 200 376 375 373 367
                        ;*     357 337 277 177
                        ;*
                        ;*  THIS  MESSAGE  WILL  BE  PRECEDED  BY 3 SYNC CHARACTERS AND REPEATED
                        ;*  THREE  TIMES.  AFTER  THE  LAST MESSAGE, SEVERAL SYNC CHARACTERS ARE
                        ;*  SENT  BEFORE  DROPING  TXE  &  RXE. 7-BIT CHARACTER LENGTHS ARE ALSO
                        ;*  UTILIZED.
                        ;*
                        ;*  IF XLB WAS NOT SPECIFIED (AND/OR BOARD TYPE IS M8064), THIS TEST MAY BE RUN
                        ;*  USING INTERNAL LOOPBACK (TTLOOP=1).
                        ;*
                        ;--**********************************************************************
                        ;
                        ;       BGNTST
027114                                                                  T4::
027114  004737  005376          JSR     PC,INIDMV       ;INIT DMV-11, ENTER MAINT LOOP
027120  042737  001000  027176  BIC     #NOLOOP,1$      ;
027126  012737  000011  027642  MOV     #9.,3$          ;INIT ENTRAN COUNT/TTLOOP STATUS
027134  023727  002470  000000  CMP     BRDTYP,#0       ;IS THIS AN M8064?
027142  001412                  BEQ     2$              ; YES: USE TTLOOP (NOT XLB).
027144  023727  002472  000004  CMP     TSTCON,#4       ;IS A LOOPBACK CONNECTOR/CABLE SPECIFIED ?
027152  001406                  BEQ     2$              ;BR IF NO
027154  052737  001000  027176  BIS     #NOLOOP,1$      ; YES: SPECIFY NO TTLOOP (INITRN)
027162  052737  100000  027642  BIS     #BIT15,3$       ;       AND SPECIFY NOLOOP IN ENTRAN
                        ;-----------------------------------------------------------------------
                        2$:     JSR     R5,INITRN       ;LOAD 1 SOM, CLK TX UNTIL ACTIVE
                        DDCMP!STRIPS!OVRC!SYNCH ;SET DDCMP,STRIP SYNC,ODD VRC,SYNCH=226
                        1$:     TXDL!RXDL       ;USE 7 BIT CHARS FOR RX & TX
                        BCC     .+8.            ;BR IF NO ERROR
                        ERROR                   ;REPORT STACKED ERROR
                                                                        TRAP    C$ERROR
                        ESCAPE  TST             ;SKIP TO END OF TEST
                                                                        TRAP    C$ESCAPE
                                                                        .WORD   L10023-.

                        JSR     R5,TXCHAR       ;LOAD 2ND SYNCH, TX 1ST SYNCH
                        SYNCH
                        7.
                        BCC     .+8.            ;BR IF NO ERROR
                        ERROR                   ;REPORT STACKED ERROR
                                                                        TRAP    C$ERROR
                        ESCAPE  TST             ;SKIP TO END OF TEST
                                                                        TRAP    C$ESCAPE
                                                                        .WORD   L10023-.
```

```
6113  027230  004537  010136          JSR     R5,TXCHAR       ;LOAD 3RD SYNCH, TX 2ND SYNCH
6114  027234  000226                  SYNCH
6115  027236  000010                  8.
6116  027240  103003                  BCC     .+8.            ;BR IF NO ERROR
6117  027242                          ERROR                   ;REPORT STACKED ERROR
6118  027242  104460                                                  TRAP    C$ERROR
6119  027244                          ESCAPE  TST             ;SKIP TO END OF TEST
6120  027244  104410                                                  TRAP    C$ESCAPE
6121  027246  000406                                                  .WORD   L10023-.
6122
6123  027250  004537  010250          JSR     R5,TXCTRL       ;CLEAR TSOM
6124  027254  000000                  000
6125  027256  000000                  0
6126
6127  027260  004537  010136          JSR     R5,TXCHAR       ;LOAD 125(DATA1), TX 3RD SYNCH
6128  027264  000125                  125
6129  027266  000010                  8.
6130  027270  103003                  BCC     .+8.            ;BR IF NO ERROR
6131  027272                          ERROR                   ;REPORT STACKED ERROR
6132  027272  104460                                                  TRAP    C$ERROR
6133  027274                          ESCAPE  TST             ;SKIP TO END OF TEST
6134  027274  104410                                                  TRAP    C$ESCAPE
6135  027276  000356                                                  .WORD   L10023-.
6136
6137  027300  004537  010136          JSR     R5,TXCHAR       ;LOAD 252(DATA2), TX 125(DATA1)
6138  027304  000252                  252
6139  027306  000010                  8.
6140  027310  103003                  BCC     .+8.            ;BR IF NO ERROR
6141  027312                          ERROR                   ;REPORT STACKED ERROR
6142  027312  104460                                                  TRAP    C$ERROR
6143  027314                          ESCAPE  TST             ;SKIP TO END OF TEST
6144  027314  104410                                                  TRAP    C$ESCAPE
6145  027316  000336                                                  .WORD   L10023-.
6146
6147  027320  004537  010136          JSR     R5,TXCHAR       ;LOAD 000(DATA3)
6148  027324  000000                  000
6149  027326  000000                  0
6150  027330  103003                  BCC     .+8.            ;BR IF NO ERROR
6151  027332                          ERROR                   ;REPORT STACKED ERROR
6152  027332  104460                                                  TRAP    C$ERROR
6153  027334                          ESCAPE  TST             ;SKIP TO END OF TEST
6154  027334  104410                                                  TRAP    C$ESCAPE
6155  027336  000316                                                  .WORD   L10023-.
6156
6157  027340  004537  011624          JSR     R5,RCV1ST       ;CLOCK AND RCV 125(DATA1)
6158  027344  000000                  0
6159  027346  103003                  BCC     .+8.            ;BR IF NO ERROR
6160  027350                          ERROR                   ;REPORT STACKED ERROR
6161  027350  104460                                                  TRAP    C$ERROR
6162  027352                          ESCAPE  TST             ;SKIP TO END OF TEST
6163  027352  104410                                                  TRAP    C$ESCAPE
6164  027354  00030C                                                  .WORD   L10023-.
6165
6166  027356  004537  010350          JSR     R5,RXCHAR       ;READ & CHK 125(DATA1), RCV 252(DATA2)
6167  027362  000125                  125
6168  027364  000001                  RERCHK                  ; & CHECK RERR BIT=0 (GOOD VRC)
```

```
6169  027366  000010                        8.
6170  027370  103003                        BCC     .+8.            ;BR IF NO ERROR
6171  027372                                ERROR                   ;REPORT STACKED ERROR
6172  027372  104460                                                                TRAP    C$ERROR
6173  027374                                ESCAPE  TST             ;SKIP TO END OF TEST
6174  027374  104410                                                                TRAP    C$ESCAPE
6175  027376  000256                                                                .WORD   L10023-.
6176                                  ;-------------------------------------------------------------
6177                                  ; TRANSMIT THE BULK OF DATA OUT OF TABLE "PATX"
6178                                  ;-------------------------------------------------------------
6179  027400  012702  002646                MOV     #PATX+1,R2      ;SET UP TABLE POINTER
6180  027404  112237  027442          5$:   MOVB    (R2)+,20$       ;SET UP EXPECTED CHARACTER
6181  027410  116237  000001  027422        MOVB    1(R2),10$       ;SET UP TRANSMIT CHARACTER
6182
6183  027416  004537  010136                JSR     R5,TXCHAR       ;LOAD A CHARACTER
6184  027422  000000                  10$:   000                     ;** HOLE FOR NEXT TX CHARACTER
6185  027424  000000                        0
6186  027426  103003                        BCC     .+8.            ;BR IF NO ERROR
6187  027430                                ERROR                   ;REPORT STACKED ERROR
6188  027430  104460                                                                TRAP    C$ERROR
6189  027432                                ESCAPE  TST             ;SKIP TO END OF TEST
6190  027432  104410                                                                TRAP    C$ESCAPE
6191  027434  000220                                                                .WORD   L10023-.
6192
6193  027436  004537  010350                JSR     R5,RXCHAR       ;CLK/RECEIVE/CHECK PREVIOUS CHARACTER
6194  027442  000000                  20$:   000                     ;** HOLE FOR EXPECTED CHARACTER
6195  027444  000001                        RERCHK                  ; & CHECK RERR BIT=0 (GOOD VRC)
6196  027446  000010                        8.
6197  027450  103003                        BCC     .+8.            ;BR IF NO ERROR
6198  027452                                ERROR                   ;REPORT STACKED ERROR
6199  027452  104460                                                                TRAP    C$ERROR
6200  027454                                ESCAPE  TST             ;SKIP TO END OF TEST
6201  027454  104410                                                                TRAP    C$ESCAPE
6202  027456  000176                                                                .WORD   L10023-.
6203
6204  027460  022702  002737                CMP     #EPATX-1,R2
6205  027464  001347                        BNE     5$
6206                                  ;-------------------------------------------------------------
6207  027466  004537  010250                JSR     R5,TXCTRL       ;LOAD TSOM
6208  027472  000001                        TSOM
6209  027474  000000                        0
6210  027476  103003                        BCC     .+8.            ;BR IF NO ERROR
6211  027500                                ERROR                   ;REPORT STACKED ERROR
6212  027500  104460                                                                TRAP    C$ERROR
6213  027502                                ESCAPE  TST             ;SKIP TO END OF TEST
6214  027502  104410                                                                TRAP    C$ESCAPE
6215  027504  000150                                                                .WORD   L10023-.
6216
6217  027506  004537  010350                JSR     R5,RXCHAR       ;READ & CHK 277, RCV 177
6218  027512  000277                        277
6219  027514  000001                        RERCHK                  ; & CHECK RERR BIT=0 (GOOD VRC)
6220  027516  000010                        8.
6221  027520  103003                        BCC     .+8.            ;BR IF NO ERROR
6222  027522                                ERROR                   ;REPORT STACKED ERROR
6223  027522  104460                                                                TRAP    C$ERROR
6224  027524                                ESCAPE  TST             ;SKIP TO END OF TEST
```

```
6225  027524  104410                                                          TRAP    C$ESCAPE
6226  027526  000126                                                          .WORD   L10023-.
6227
6228  027530  004537  010250          JSR     R5,TXCTRL       ;LOAD 2ND TSOM
6229  027534  000001                  TSOM
6230  027536  000000                  0
6231  027540  103003                  BCC     .+8.            ;BR IF NO ERROR
6232  027542                          ERROR                   ;REPORT STACKED ERROR
6233  027542  104460                                                          TRAP    C$ERROR
6234  027544                          ESCAPE  TST             ;SKIP TO END OF TEST
6235  027544  104410                                                          TRAP    C$ESCAPE
6236  027546  000106                                                          .WORD   L10023-.
6237
6238  027550  004537  010350          JSR     R5,RXCHAR       ;READ & CHK 177, RCV FIRST SYNC
6239  027554  000177                  177
6240  027556  000001                  RERCHK                  ; & CHECK RERR BIT=0 (GOOD VRC)
6241  027560  000010                  8.
6242  027562  103003                  BCC     .+8.            ;BR IF NO ERROR
6243  027564                          ERROR                   ;REPORT STACKED ERROR
6244  027564  104460                                                          TRAP    C$ERROR
6245  027566                          ESCAPE  TST             ;SKIP TO END OF TEST
6246  027566  104410                                                          TRAP    C$ESCAPE
6247  027570  000064                                                          .WORD   L10023-.
6248
6249  027572  004537  010350          JSR     R5,RXCHAR       ;READ & CHK 1ST SYNC, RCV SECOND SYNC
6250  027576  000226                  SYNCH
6251  027600  000001                  RERCHK                  ; & CHECK RERR BIT=0 (GOOD VRC)
6252  027602  000010                  8.
6253  027604  103003                  BCC     .+8.            ;BR IF NO ERROR
6254  027606                          ERROR                   ;REPORT STACKED ERROR
6255  027606  104460                                                          TRAP    C$ERROR
6256  027610                          ESCAPE  TST             ;SKIP TO END OF TEST
6257  027610  104410                                                          TRAP    C$ESCAPE
6258  027612  000042                                                          .WORD   L10023-.
6259
6260  027614  004537  010350          JSR     R5,RXCHAR       ;READ & CHK 2ND SYNC, RCV NEXT ONE
6261  027620  000226                  SYNCH
6262  027622  000001                  RERCHK                  ; & CHECK RERR BIT=0 (GOOD VRC)
6263  027624  000010                  8.
6264  027626  103003                  BCC     .+8.            ;BR IF NO ERROR
6265  027630                          ERROR                   ;REPORT STACKED ERROR
6266  027630  104460                                                          TRAP    C$ERROR
6267  027632                          ESCAPE  TST             ;SKIP TO END OF TEST
6268  027632  104410                                                          TRAP    C$ESCAPE
6269  027634  000020                                                          .WORD   L10023-.
6270
```

```
 6271  027636  004537  011772            JSR     R5,ENTRAN       ;SHUT DOWN TRANSMITTER, RECEIVER
 6272  027642  000011              3$:     9.
 6273  027644  103003                      BCC     .+8.            ;BR IF NO ERROR
 6274  027646                              ERROR                   ;REPORT STACKED ERROR
 6275  027646  104460                                                      TRAP    C$ERROR
 6276  027650                              ESCAPE  TST             ;SKIP TO END OF TEST
 6277  027650  104410                                                      TRAP    C$ESCAPE
 6278  027652  000002                                                      .WORD   L10023-.
 6279  027654              ENDTST
 6280  027654                                                  L10023:
 6281  027654  104401                                                      TRAP    C$ETST
```

```
                        .SBTTL  TEST 5 -- DATA TEST -- BCP XLB EVEN VRC

                        ;+*********************************************************************************
                        ;*
                        ;*      TEST 5 -- DATA TEST -- BCP XLB EVEN VRC
                        ;*
                        ;*  IF  XLB  IS  SPECIFIED  IN  THE  P-TABLE,  THIS TEST WILL TRANSMIT &
                        ;*  RECEIVE  IN  BCP  MODE  WITH  EVEN VRC ERROR DETECTION THE FOLLOWING
                        ;*  MESSAGE:
                        ;*
                        ;*     125  252  000 377 001 002 004 010 020 040 100 200 376 375 373 367
                        ;*     357 337 277 177
                        ;*
                        ;*  THIS  MESSAGE  WILL  BE  PRECEDED  BY 3 SYNC CHARACTERS AND REPEATED
                        ;*  THREE  TIMES.  AFTER  THE  LAST MESSAGE, SEVERAL SYNC CHARACTERS ARE
                        ;*  SENT  BEFORE  DROPING  TXE  &  RXE. 7-BIT CHARACTER LENGTHS ARE ALSO
                        ;*  UTILIZED.
                        ;*
                        ;*  IF XLB WAS NOT SPECIFIED (AND/OR BOARD TYPE IS M8064), THIS TEST MAY BE RUN
                        ;*  USING INTERNAL LOOPBACK (TTLOOP=1).
                        ;*
                        ;-*********************************************************************************
                        ;
                        ;       BGNTST
                                                                                                T5::
027656                  
027656  004737  005376          JSR     PC,INIDMV       ;INIT DMV-11, ENTER M-LOOP
027662  042737  001000  027740  BIC     #NOLOOP,1$      ;
027670  012737  000011  030404  MOV     #9.,3$          ;INIT ENTRAN COUNT/STATUS
027676  023727  002470  000000  CMP     BRDTYP,#60      ;IS BOARD TYPE M8064?
027704  001412                  BEQ     2$              ; YES: SPECIFY TTLOOP (NOT XLB)
027706  023727  002472  000004  CMP     TSTCON,#4       ;IS A LOOPBACK CONNECTOR/CABLE SPECIFIED ?
027714  001406                  BEQ     2$              ;BR IF NO
027716  052737  001000  027740  BIS     #NOLOOP,1$      ; YES: SPECIFY NO TTLOOP (INITRN)
027724  053737  100000  030404  BIS     BIT15,3$        ;       AND SPECIFY NOLOOP IN ENTRAN
                        ;-----------------------------------------------------------------------
027732  004537  007234    2$:   JSR     R5,INITRN       ;LOAD 1 SOM, CLK TX UNTIL ACTIVE
027736  062626                  DDCMP!STRIPS!EVRC!SYNCH  ;SET DDCMP,STRIP SYNCH,EVEN VRC,SYNCH=226
027740  000347            1$:   TXDL!RXDL               ;USE 7 BIT CHARS FOR TX & RX
027742  103003                  BCC     .+8.            ;BR IF NO ERROR
027744                          ERROR                   ;REPORT STACKED ERROR
027744  104460                                                          TRAP    C$ERROR
027746                          ESCAPE  TST             ;SKIP TO END OF TEST
027746  104410                                                          TRAP    C$ESCAPE
027750  000446                                                          .WORD   L10024-.
                        
027752  004537  010136          JSR     R5,TXCHAR       ;LOAD 2ND SYNCH, TX 1ST SYNCH
027756  000226                  SYNCH
027760  000007                  7.
027762  103003                  BCC     .+8.            ;BR IF NO ERROR
027764                          ERROR                   ;REPORT STACKED ERROR
027764  104460                                                          TRAP    C$ERROR
027766                          ESCAPE  TST             ;SKIP TO END OF TEST
027766  104410                                                          TRAP    C$ESCAPE
027770  000426                                                          .WORD   L10024-.
                        
027772  004537  010136          JSR     R5,TXCHAR       ;LOAD 3RD SYNCH, TX 2ND SYNCH
```

```
 6338  027776  000226                    SYNCH
 6339  030000  000010                    8.
 6340  030002  103003                    BCC     .+8.            ;BR IF NO ERROR
 6341  030004                            ERROR                   ;REPORT STACKED ERROR
 6342  030004  104460                                                    TRAP    C$ERROR
 6343  030006                            ESCAPE  TST             ;SKIP TO END OF TEST
 6344  030006  104410                                                    TRAP    C$ESCAPE
 6345  030010  000406                                                    .WORD   L10024-.
 6346
 6347  030012  004537  010250            JSR     R5,TXCTRL       ;CLEAR TSOM
 6348  030016  000000                    000
 6349  030020  000000                    0
 6350
 6351  030022  004537  010136            JSR     R5,TXCHAR       ;LOAD 125(DATA1), TX 3RD SYNCH
 6352  030026  000125                    125
 6353  030030  000010                    8.
 6354  030032  103003                    BCC     .+8.            ;BR IF NO ERROR
 6355  030034                            ERROR                   ;REPORT STACKED ERROR
 6356  030034  104460                                                    TRAP    C$ERROR
 6357  030036                            ESCAPE  TST             ;SKIP TO END OF TEST
 6358  030036  104410                                                    TRAP    C$ESCAPE
 6359  030040  000356                                                    .WORD   L10024-.
 6360
 6361  030042  004537  010136            JSR     R5,TXCHAR       ;LOAD 252(DATA2), TX 125(DATA1)
 6362  030046  000252                    252
 6363  030050  000010                    8.
 6364  030052  103003                    BCC     .+8.            ;BR IF NO ERROR
 6365  030054                            ERROR                   ;REPORT STACKED ERROR
 6366  030054  104460                                                    TRAP    C$ERROR
 6367  030056                            ESCAPE  TST             ;SKIP TO END OF TEST
 6368  030056  104410                                                    TRAP    C$ESCAPE
 6369  030060  000336                                                    .WORD   L10024-.
 6370
 6371  030062  004537  010136            JSR     R5,TXCHAR       ;LOAD 000(DATA3)
 6372  030066  000000                    000
 6373  030070  000000                    0
 6374  030072  103003                    BCC     .+8.            ;BR IF NO ERROR
 6375  030074                            ERROR                   ;REPORT STACKED ERROR
 6376  030074  104460                                                    TRAP    C$ERROR
 6377  030076                            ESCAPE  TST             ;SKIP TO END OF TEST
 6378  030076  104410                                                    TRAP    C$ESCAPE
 6379  030100  000316                                                    .WORD   L10024-.
 6380
 6381  030102  004537  011624            JSR     R5,RCV1ST       ;CLOCK AND RCV 125(DATA1)
 6382  030106  000000                    0
 6383  030110  103003                    BCC     .+8.            ;BR IF NO ERROR
 6384  030112                            ERROR                   ;REPORT STACKED ERROR
 6385  030112  104460                                                    TRAP    C$ERROR
 6386  030114                            ESCAPE  TST             ;SKIP TO END OF TEST
 6387  030114  104410                                                    TRAP    C$ESCAPE
 6388  030116  000300                                                    .WORD   L10024-.
 6389
 6390  030120  004537  010350            JSR     R5,RXCHAR       ;READ & CHK 125(DATA1), RCV 252(DATA2)
 6391  030124  000125                    125
 6392  030126  000001                    RERCHK                  ; & CHECK RERR BIT=0 (GOOD VRC)
 6393  030130  000010                    8.
```

```
6394  030132  103003                  BCC     .+8.            ;BR IF NO ERROR
6395  030134                          ERROR                   ;REPORT STACKED ERROR
6396  030134  104460                                                  TRAP    C$ERROR
6397  030136                          ESCAPE  TST             ;SKIP TO END OF TEST
6398  030136  104410                                                  TRAP    C$ESCAPE
6399  030140  000256                                                  .WORD   L10024-.
6400                          ;-----------------------------------------------------------------
6401                          ; TRANSMIT THE BULK OF DATA OUT OF TABLE "PATX"
6402                          ;-----------------------------------------------------------------
6403  030142  012702  002646          MOV     #PATX+1,R2      ;SET UP TABLE POINTER
6404  030146  112237  030204  5$:     MOVB    (R2)+,20$       ;SET UP EXPECTED CHARACTER
6405  030152  116237  000001  030164  MOVB    1(R2),10$       ;SET UP TRANSMIT CHARACTER
6406
6407  030160  004537  010136          JSR     R5,TXCHAR       ;LOAD A CHARACTER
6408  030164  000000          10$:    000                     ;** HOLE FOR NEXT TX CHARACTER
6409  030166  000000                  0
6410  030170  103003                  BCC     .+8.            ;BR IF NO ERROR
6411  030172                          ERROR                   ;REPORT STACKED ERROR
6412  030172  104460                                                  TRAP    C$ERROR
6413  030174                          ESCAPE  TST             ;SKIP TO END OF TEST
6414  030174  104410                                                  TRAP    C$ESCAPE
6415  030176  000220                                                  .WORD   L10024-.
6416
6417  030200  004537  010350          JSR     R5,RXCHAR       ;CLK/RECEIVE/CHECK PREVIOUS CHARACTER
6418  030204  000000          20$:    000                     ;** HOLE FOR EXPECTED CHARACTER
6419  030206  000001                  RERCHK                  ; & CHECK RERR BIT=0 (GOOD VRC)
6420  030210  000010                  8.
6421  030212  103003                  BCC     .+8.            ;BR IF NO ERROR
6422  030214                          ERROR                   ;REPORT STACKED ERROR
6423  030214  104460                                                  TRAP    C$ERROR
6424  030216                          ESCAPE  TST             ;SKIP TO END OF TEST
6425  030216  104410                                                  TRAP    C$ESCAPE
6426  030220  000176                                                  .WORD   L10024-.
6427
6428  030222  022702  002737          CMP     #EPATX-1,R2
6429  030226  001347                  BNE     5$
6430                          ;-----------------------------------------------------------------
6431  030230  004537  010250          JSR     R5,TXCTRL       ;LOAD 1ST TSOM
6432  030234  000001                  TSOM
6433  030236  000000                  0
6434  030240  103003                  BCC     .+8.            ;BR IF NO ERROR
6435  030242                          ERROR                   ;REPORT STACKED ERROR
6436  030242  104460                                                  TRAP    C$ERROR
6437  030244                          ESCAPE  TST             ;SKIP TO END OF TEST
6438  030244  104410                                                  TRAP    C$ESCAPE
6439  030246  000150                                                  .WORD   L10024-.
6440
6441  030250  004537  010350          JSR     R5,RXCHAR       ;READ & CHK 277, RCV 177
6442  030254  000277                  277
6443  030256  000001                  RERCHK                  ; & CHECK RERR BIT=0 (GOOD VRC)
6444  030260  000010                  8.
6445  030262  103003                  BCC     .+8.            ;BR IF NO ERROR
6446  030264                          ERROR                   ;REPORT STACKED ERROR
6447  030264  104460                                                  TRAP    C$ERROR
6448  030266                          ESCAPE  TST             ;SKIP TO END OF TEST
6449  030266  104410                                                  TRAP    C$ESCAPE
```

```
6450  030270  000126                                                          .WORD   L10024-.
6451
6452  030272  004537  010250          JSR     R5,TXCTRL       ;LOAD 2ND TSOM
6453  030276  000001                  TSOM
6454  030300  000000                  0
6455  030302  103003                  BCC     .+8.            ;BR IF NO ERROR
6456  030304                          ERROR                   ;REPORT STACKED ERROR
6457  030304  104460                                                          TRAP    C$ERROR
6458  030306                          ESCAPE  TST             ;SKIP TO END OF TEST
6459  030306  104410                                                          TRAP    C$ESCAPE
6460  030310  000106                                                          .WORD   L10024-.
6461
6462  030312  004537  010350          JSR     R5,RXCHAR       ;READ & CHK 177, RCV FIRST SYNC
6463  030316  000177                  177
6464  030320  000001                  RERCHK                  ; & CHECK RERR BIT=0 (GOOD VRC)
6465  030322  000010                  8.
6466  030324  103003                  BCC     .+8.            ;BR IF NO ERROR
6467  030326                          ERROR                   ;REPORT STACKED ERROR
6468  030326  104460                                                          TRAP    C$ERROR
6469  030330                          ESCAPE  TST             ;SKIP TO END OF TEST
6470  030330  104410                                                          TRAP    C$ESCAPE
6471  030332  000064                                                          .WORD   L10024-.
6472
6473  030334  004537  010350          JSR     R5,RXCHAR       ;READ & CHK 1ST SYNC, RCV SECOND SYNC
6474  030340  000226                  SYNCH
6475  030342  000001                  RERCHK                  ; & CHECK RERR BIT=0 (GOOD VRC)
6476  030344  000010                  8.
6477  030346  103003                  BCC     .+8.            ;BR IF NO ERROR
6478  030350                          ERROR                   ;REPORT STACKED ERROR
6479  030350  104460                                                          TRAP    C$ERROR
6480  030352                          ESCAPE  TST             ;SKIP TO END OF TEST
6481  030352  104410                                                          TRAP    C$ESCAPE
6482  030354  000042                                                          .WORD   L10024-.
6483
6484  030356  004537  010350          JSR     R5,RXCHAR       ;READ & CHK 2ND SYNC, RCV NEXT ONE
6485  030362  000226                  SYNCH
6486  030364  000001                  RERCHK                  ; & CHECK RERR BIT=0 (GOOD VRC)
6487  030366  000010                  8.
6488  030370  103003                  BCC     .+8.            ;BR IF NO ERROR
6489  030372                          ERROR                   ;REPORT STACKED ERROR
6490  030372  104460                                                          TRAP    C$ERROR
6491  030374                          ESCAPE  TST             ;SKIP TO END OF TEST
6492  030374  104410                                                          TRAP    C$ESCAPE
6493  030376  000020                                                          .WORD   L10024-.
6494
6495  030400  004537  011772          JSR     R5,ENTRAN       ;SHUT DOWN TRANSMITTER, RECEIVER
6496  030404  000011          3$:     9.                      ;
6497  030406  103003                  BCC     .+8.            ;BR IF NO ERROR
6498  030410                          ERROR                   ;REPORT STACKED ERROR
6499  030410  104460                                                          TRAP    C$ERROR
6500  030412                          ESCAPE  TST             ;SKIP TO END OF TEST
6501  030412  104410                                                          TRAP    C$ESCAPE
6502  030414  000002                                                          .WORD   L10024-.
6503  030416                  ENDTST
6504  030416                                                          L10024:
6505  030416  104401                                                          TRAP    C$ETST
```

```
                                .SBTTL  TEST 6 -- DATA TEST -- BOP XLB CRC-CCITT-1

                                ;+*********************************************************************
                                ;*
                                ;*      TEST 6 -- DATA TEST -- BOP XLB CRC-CCITT-1
                                ;*
                                ;*  IF  XLB  IS  SPECIFIED  IN  THE  P-TABLE,  THIS TEST WILL TRANSMIT &
                                ;*  RECEIVE  IN  BOP MODE WITH CRC-CCITT-1 ERROR DETECTION THE FOLLOWING
                                ;*  SHORT MESSAGE:  125  252  000 377 001
                                ;*
                                ;*  THIS  MESSAGE  WILL  BE  PRECEDED  BY FLAG CHARACTERS AND REPEATED
                                ;*  THREE  TIMES WITH CRC AND FLAG'S FOLLOWING EACH ONE. 8-BIT CHARACTER
                                ;*  LENGTHS ARE ALSO UTILIZED.
                                ;*
                                ;*  IF XLB WAS NOT SPECIFIED (AND/OR BOARD TYPE IS M8064), THIS TEST MAY BE RUN
                                ;*  USING INTERNAL LOOPBACK (TTLOOP=1).
                                ;*
                                ;--*********************************************************************
                                ;
                                ;       BGNTST
030420                                                                  T6::
030420  012737  000003  002526          MOV     #3,REG0         ;INIT COUNT (TEXT TRANSMITTED 3 TIMES)
030426  004737  005376                  JSR     PC,INIDMV       ;INIT DMV-11, ENTER MAINT LOOP
030432  042737  001000  030474          BIC     #NOLOOP,1$      ;
030440  023727  002470  000000          CMP     BRDTYP,#0       ;IS BOARD TYPE = M8064 ?
030446  001407                          BEQ     2$              ; YES: SPECIFY TTLOOP (NO XLB)
030450  023727  002472  000004          CMP     TSTCON,#4       ;IS A LOOPBACK CONNECTOR/CABLE SPECIFIED ?
030456  001403                          BEQ     2$              ;BR IF NO
030460  052737  001000  030474          BIS     #NOLOOP,1$      ; YES: SPECIFY NO TTLOOP (INITRN)
                                ;-------------------------------------------------------------------
030466  004537  007234          2$:     JSR     R5,INITRN       ;LOAD 1 SOM, CLK TX UNTIL ACTIVE
030472  000000                          0                       ;SET BOP MODE,CRC-CCITT=>1'S CHECK
030474  000000                  1$:     0                       ;USE 8 BIT CHARS
030476  103003                          BCC     .+8.            ;BR IF NO ERROR
030500                                  ERROR                   ;REPORT STACKED ERROR
030500  104460                                                                  TRAP    C$ERROR
030502                                  ESCAPE  TST             ;SKIP TO END OF TEST
030502  104410                                                                  TRAP    C$ESCAPE
030504  000374                                                                  .WORD   L10025-.
                                ;
030506  004537  010250                  JSR     R5,TXCTRL       ;LOAD 2ND FLAG, TX 1ST FLAG
030512  000001                          TSOM
030514  000007                          7.
030516  004537  010250                  JSR     R5,TXCTRL       ;LOAD 3RD FLAG, TX 2ND FLAG
030522  000001                          TSOM
030524  000010                          8.
030526  004537  010250                  JSR     R5,TXCTRL       ;LOAD 4TH FLAG, TX 3RD FLAG
030532  000001                          TSOM
030534  000010                          8.
030536  004537  010250                  JSR     R5,TXCTRL       ;CLEAR TSOM
030542  000000                          000
030544  000000                          0
030546  004537  010136                  JSR     R5,TXCHAR       ;LOAD DATA1(125), TX 4TH FLAG
030552  000125                          125
030554  000010                          8.
030556  103003                          BCC     .+8.            ;BR IF NO ERROR
```

```
6562  030560                          ERROR                   ;REPORT STACKED ERROR
6563  030560  104460                                                          TRAP    C$ERROR
6564  030562                          ESCAPE  TST             ;SKIP TO END OF TEST
6565  030562  104410                                                          TRAP    C$ESCAPE
6566  030564  000314                                                          .WORD   L10025-.
6567
6568  030566  004537  010136          JSR     R5,TXCHAR       ;LOAD DATA2(252), TX DATA1(125)
6569  030572  000252                  252
6570  030574  000010                  8.
6571  030576  103003                  BCC     .+8.            ;BR IF NO ERROR
6572  030600                          ERROR                   ;REPORT STACKED ERROR
6573  030600  104460                                                          TRAP    C$ERROR
6574  030602                          ESCAPE  TST             ;SKIP TO END OF TEST
6575  030602  104410                                                          TRAP    C$ESCAPE
6576  030604  000274                                                          .WORD   L10025-.
6577
6578  030606  004537  010136          JSR     R5,TXCHAR       ;LOAD DATA3(000), TX DATA2(252)
6579  030612  000000                  000
6580  030614  000010                  8.
6581  030616  103003                  BCC     .+8.            ;BR IF NO ERROR
6582  030620                          ERROR                   ;REPORT STACKED ERROR
6583  030620  104460                                                          TRAP    C$ERROR
6584  030622                          ESCAPE  TST             ;SKIP TO END OF TEST
6585  030622  104410                                                          TRAP    C$ESCAPE
6586  030624  000254                                                          .WORD   L10025-.
6587
6588  030626  004537  010136          JSR     R5,TXCHAR       ;LOAD DATA4(377), TX DATA3(000)
6589  030632  000377                  377
6590  030634  000010                  8.
6591  030636  103003                  BCC     .+8.            ;BR IF NO ERROR
6592  030640                          ERROR                   ;REPORT STACKED ERROR
6593  030640  104460                                                          TRAP    C$ERROR
6594  030642                          ESCAPE  TST             ;SKIP TO END OF TEST
6595  030642  104410                                                          TRAP    C$ESCAPE
6596  030644  000234                                                          .WORD   L10025-.
6597
6598  030646  004537  010136          JSR     R5,TXCHAR       ;LOAD DATA5(001), TX DATA4(377)
6599  030652  000001                  001
6600  030654  000011                  9.
6601  030656  103003                  BCC     .+8.            ;BR IF NO ERROR
6602  030660                          ERROR                   ;REPORT STACKED ERROR
6603  030660  104460                                                          TRAP    C$ERROR
6604  030662                          ESCAPE  TST             ;SKIP TO END OF TEST
6605  030662  104410                                                          TRAP    C$ESCAPE
6606  030664  000214                                                          .WORD   L10025-.
6607
6608  030666  004537  010250          JSR     R5,TXCTRL       ;SET TEOM
6609  030672  000002                  TEOM
6610  030674  000000                  0
6611
6612  030676  004537  011624          JSR     R5,RCV1ST       ;CLOCK AND RCV DATA1(125)
6613  030702  000000                  0
6614  030704  103003                  BCC     .+8.            ;BR IF NO ERROR
6615  030706                          ERROR                   ;REPORT STACKED ERROR
6616  030706  104460                                                          TRAP    C$ERROR
6617  030710                          ESCAPE  TST             ;SKIP TO END OF TEST
```

```
6618  030710  104410                                                          TRAP    C$ESCAPE
6619  030712  000166                                                          .WORD   L10025-.
6620
6621  030714  004537  010350          JSR     R5,RXCHAR       ;READ/CHK DATA1(125), RCV DATA2(252)
6622  030720  000525                  RXSOM!125               ; & CHECK RSOM=1
6623  030722  000000                  0
6624  030724  000010                  8.
6625  030726  103003                  BCC     .+8.            ;BR IF NO ERROR
6626  030730                          ERROR                   ;REPORT STACKED ERROR
6627  030730  104460                                                          TRAP    C$ERROR
6628  030732                          ESCAPE  TST             ;SKIP TO END OF TEST
6629  030732  104410                                                          TRAP    C$ESCAPE
6630  030734  000144                                                          .WORD   L10025-.
6631
6632  030736  004537  010250          JSR     R5,TXCTRL       ;SET TEOM
6633  030742  000002                  TEOM
6634  030744  000000                  0
6635
6636  030746  004537  010350          JSR     R5,RXCHAR       ;READ/CHK DATA2(252), RCV DATA3(000)
6637  030752  000252                  252
6638  030754  000000                  0
6639  030756  000010                  8.
6640  030760  103003                  BCC     .+8.            ;BR IF NO ERROR
6641  030762                          ERROR                   ;REPORT STACKED ERROR
6642  030762  104460                                                          TRAP    C$ERROR
6643  030764                          ESCAPE  TST             ;SKIP TO END OF TEST
6644  030764  104410                                                          TRAP    C$ESCAPE
6645  030766  000112                                                          .WORD   L10025-.
6646
6647  030770  004537  010350          JSR     R5,RXCHAR       ;READ/CHK DATA3(000), RCV DATA4(377)
6648  030774  000000                  000
6649  030776  000000                  0
6650  031000  000010                  8.
6651  031002  103003                  BCC     .+8.            ;BR IF NO ERROR
6652  031004                          ERROR                   ;REPORT STACKED ERROR
6653  031004  104460                                                          TRAP    C$ERROR
6654  031006                          ESCAPE  TST             ;SKIP TO END OF TEST
6655  031006  104410                                                          TRAP    C$ESCAPE
6656  031010  000070                                                          .WORD   L10025-.
6657
6658  031012  004537  010350          JSR     R5,RXCHAR       ;READ/CHK DATA4(377), RCV DATA5(001)
6659  031016  000377                  377
6660  031020  000000                  0
6661  031022  020010                  NCRACT!8.               ;DON'T CHECK FOR FINAL RXACT=1
6662  031024  103003                  BCC     .+8.            ;BR IF NO ERROR
6663  031026                          ERROR                   ;REPORT STACKED ERROR
6664  031026  104460                                                          TRAP    C$ERROR
6665  031030                          ESCAPE  TST             ;SKIP TO END OF TEST
6666  031030  104410                                                          TRAP    C$ESCAPE
6667  031032  000046                                                          .WORD   L10025-.
6668
6669  031034  004537  010350          JSR     R5,RXCHAR       ;READ/CHK DATA5(001), RCV FIRST FLAG
6670  031040  001001                  RXEOM!001               ; & CHECK REOM
6671  031042  000001                  RERCHK                  ; & CHECK RERR BIT=0 (GOOD CRC)
6672  031044  060000                  NFCRDA!NCRACT           ;DON'T CHECK FOR FINAL RDA=RXACT=1
6673  031046  103003                  BCC     .+8.            ;BR IF NO ERROR
```

```
6674  031050                                ERROR                   ;REPORT STACKED ERROR
6675  031050  104460                                                                TRAP    C$ERROR
6676  031052                                ESCAPE  TST             ;SKIP TO END OF TEST
6677  031052  104410                                                                TRAP    C$ESCAPE
6678  031054  000024                                                                .WORD   L10025-.
6679                                  ;-----------------------------------------------------------------------
6680  031056  005337  002526                DEC     REG0            ;DECREMENT COUNT
6681  031062  001406                        BEQ     40$             ;BR IF TRIPLE LOOP IS COMPLETED
6682
6683  031064  004537  010250                JSR     R5,TXCTRL       ;CLEAR TEOM, SET TSOM
6684  031070  000001                        TSOM
6685  031072  000001                        1
6686  031074  000137  030466                JMP     2$              ;AND RUN TX/RX AGAIN
6687  031100                          40$:
6688  031100                          ENDTST
6689  031100                                                                  L10025:
6690  031100  104401                                                                TRAP    C$ETST
```

```
                                .SBTTL  TEST 7 -- DATA TEST -- BOP XLB CRC-CCITT-0

                                ;+*********************************************************************************
                                ;*
                                ;*      TEST 7 -- DATA TEST -- BOP XLB CRC-CCITT-0
                                ;*
                                ;*  IF  XLB  IS  SPECIFIED  IN  THE  P-TABLE,  THIS TEST WILL TRANSMIT &
                                ;*  RECEIVE  IN  BOP MODE WITH CRC-CCITT-0 ERROR DETECTION THE FOLLOWING
                                ;*  SHORT MESSAGE:  125  252  000  377  001
                                ;*
                                ;*  THIS  MESSAGE  WILL  BE  PRECEDED  BY FLAG CHARACTERS AND REPEATED
                                ;*  THREE  TIMES WITH CRC AND FLAG'S FOLLOWING EACH ONE. 8-BIT CHARACTER
                                ;*  LENGTHS ARE ALSO UTILIZED.
                                ;*
                                ;*  IF XLB WAS NOT SPECIFIED (AND/OR BOARD TYPE IS M8064), THIS TEST MAY BE RUN
                                ;*  USING INTERNAL LOOPBACK (TTLOOP=1).
                                ;*
                                ;--*********************************************************************************
                                ;
                                ;       BGNTST
                                                                                        T7::
031102                                  MOV     #3,R0           ;INIT COUNT (TEXT TRANSMITTED 3 TIMES)
031102  012737  000003  002526          JSR     PC,INIDMV       ;INIT DMV-11, ENTER MAINT LOOP
031110  004737  005376                  BIC     #NOLOOP,1$      ;
031114  042737  001000  031156          CMP     BRDTYP,#0       ;BOARD TYPE = M8064 ?
031122  023727  002470  000000          BEQ     2$              ; YES: SPECIFY TTLOOP (NOT XLB)
031130  001407                          CMP     TSTCON,#4       ;IS A LOOPBACK CONNECTOR/CABLE SPECIFIED ?
031132  023727  002472  000004          BEQ     2$              ;BR IF NO
031140  001403                          BIS     #NOLOOP,1$      ; YES: SPECIFY NO TTLOOP (INITRN)
031142  052737  001000  031156
                                ;-----------------------------------------------------------------------
031150  004537  007234          2$:     JSR     R5,INITRN       ;LOAD 1 SOM, CLK TX UNTIL ACTIVE
031154  000400                          CRCOS                   ;SET BOP MODE,CRC-CCITT=>0'S CHECK
031156  000000                  1$:     0                       ;USE 8 BIT CHARS
031160  103003                          BCC     .+8.            ;BR IF NO ERROR
031162                                  ERROR                   ;REPORT STACKED ERROR
031162  104460                                                                  TRAP    C$ERROR
031164                                  ESCAPE  TST             ;SKIP TO END OF TEST
031164  104410                                                                  TRAP    C$ESCAPE
031166  000374                                                                  .WORD   L10026-.

031170  004537  010250                  JSR     R5,TXCTRL       ;LOAD 2ND FLAG, TX 1ST FLAG
031174  000001                          TSOM
031176  000007                          7.
031200  004537  010250                  JSR     R5,TXCTRL       ;LOAD 3RD FLAG, TX 2ND FLAG
031204  000001                          TSOM
031206  000010                          8.
031210  004537  010250                  JSR     R5,TXCTRL       ;LOAD 4TH FLAG, TX 3RD FLAG
031214  000001                          TSOM
031216  000010                          8.
031220  004537  010250                  JSR     R5,TXCTRL       ;CLEAR TSOM
031224  000000                          000
031226  000000                          0
031230  004537  010136                  JSR     R5,TXCHAR       ;LOAD DATA1(125), TX 4TH FLAG
031234  000125                          125
031236  000010                          8.
031240  103003                          BCC     .+8.            ;BR IF NO ERROR
```

```
 6747  031242                                 ERROR                   ;REPORT STACKED ERROR
 6748  031242  104460                                                                 TRAP    C$ERROR
 6749  031244                                 ESCAPE  TST             ;SKIP TO END OF TEST
 6750  031244  104410                                                                 TRAP    C$ESCAPE
 6751  031246  000314                                                                 .WORD   L10026-.
 6752
 6753  031250  004537  010136                JSR     R5,TXCHAR       ;LOAD DATA2(252), TX DATA1(125)
 6754  031254  000252                        252
 6755  031256  000010                        8.
 6756  031260  103003                        BCC     .+8.            ;BR IF NO ERROR
 6757  031262                                 ERROR                   ;REPORT STACKED ERROR
 6758  031262  104460                                                                 TRAP    C$ERROR
 6759  031264                                 ESCAPE  TST             ;SKIP TO END OF TEST
 6760  031264  104410                                                                 TRAP    C$ESCAPE
 6761  031266  000274                                                                 .WORD   L10026-.
 6762
 6763  031270  004537  010136                JSR     R5,TXCHAR       ;LOAD DATA3(000), TX DATA2(252)
 6764  031274  000000                        000
 6765  031276  000010                        8.
 6766  031300  103003                        BCC     .+8.            ;BR IF NO ERROR
 6767  031302                                 ERROR                   ;REPORT STACKED ERROR
 6768  031302  104460                                                                 TRAP    C$ERROR
 6769  031304                                 ESCAPE  TST             ;SKIP TO END OF TEST
 6770  031304  104410                                                                 TRAP    C$ESCAPE
 6771  031306  000254                                                                 .WORD   L10026-.
 6772
 6773  031310  004537  010136                JSR     R5,TXCHAR       ;LOAD DATA4(377), TX DATA3(000)
 6774  031314  000377                        377
 6775  031316  000010                        8.
 6776  031320  103003                        BCC     .+8.            ;BR IF NO ERROR
 6777  031322                                 ERROR                   ;REPORT STACKED ERROR
 6778  031322  104460                                                                 TRAP    C$ERROR
 6779  031324                                 ESCAPE  TST             ;SKIP TO END OF TEST
 6780  031324  104410                                                                 TRAP    C$ESCAPE
 6781  031326  000234                                                                 .WORD   L10026-.
 6782
 6783  031330  004537  010136                JSR     R5,TXCHAR       ;LOAD DATA5(001), TX DATA4(377)
 6784  031334  000001                        001
 6785  031336  000011                        9.
 6786  031340  103003                        BCC     .+8.            ;BR IF NO ERROR
 6787  031342                                 ERROR                   ;REPORT STACKED ERROR
 6788  031342  104460                                                                 TRAP    C$ERROR
 6789  031344                                 ESCAPE  TST             ;SKIP TO END OF TEST
 6790  031344  104410                                                                 TRAP    C$ESCAPE
 6791  031346  000214                                                                 .WORD   L10026-.
 6792
 6793  031350  004537  010250                JSR     R5,TXCTRL       ;SET TEOM
 6794  031354  000002                        TEOM
 6795  031356  000000                        0
 6796  031360  004537  011624                JSR     R5,RCV1ST       ;CLOCK AND RCV DATA1(125)
 6797  031364  000000                        0
 6798  031366  103003                        BCC     .+8.            ;BR IF NO ERROR
 6799  031370                                 ERROR                   ;REPORT STACKED ERROR
 6800  031370  104460                                                                 TRAP    C$ERROR
 6801  031372                                 ESCAPE  TST             ;SKIP TO END OF TEST
 6802  031372  104410                                                                 TRAP    C$ESCAPE
```

```
6803  031374  000166                                                          .WORD   L10026-.
6804
6805  031376  004537  010350          JSR     R5,RXCHAR       ;READ/CHK DATA1(125), RCV DATA2(252)
6806  031402  000525                  RXSOM!125               ; & CHECK RSOM=1
6807  031404  000000                  0
6808  031406  000010                  8.
6809  031410  103003                  BCC     .+8.            ;BR IF NO ERROR
6810  031412                          ERROR                   ;REPORT STACKED ERROR
6811  031412  104460                                                          TRAP    C$ERROR
6812  031414                          ESCAPE  TST             ;SKIP TO END OF TEST
6813  031414  104410                                                          TRAP    C$ESCAPE
6814  031416  000144                                                          .WORD   L10026-.
6815
6816  031420  004537  010250          JSR     R5,TXCTRL       ;SET TEOM
6817  031424  000002                  TEOM
6818  031426  000000                  0
6819  031430  004537  010350          JSR     R5,RXCHAR       ;READ/CHK DATA2(252), RCV DATA3(000)
6820  031434  000252                  252
6821  031436  000000                  0
6822  031440  000010                  8.
6823  031442  103003                  BCC     .+8.            ;BR IF NO ERROR
6824  031444                          ERROR                   ;REPORT STACKED ERROR
6825  031444  104460                                                          TRAP    C$ERROR
6826  031446                          ESCAPE  TST             ;SKIP TO END OF TEST
6827  031446  104410                                                          TRAP    C$ESCAPE
6828  031450  000112                                                          .WORD   L10026-.
6829
6830  031452  004537  010350          JSR     R5,RXCHAR       ;READ/CHK DATA3(000), RCV DATA4(377)
6831  031456  000000                  000
6832  031460  000000                  0
6833  031462  000010                  8.
6834  031464  103003                  BCC     .+8.            ;BR IF NO ERROR
6835  031466                          ERROR                   ;REPORT STACKED ERROR
6836  031466  104460                                                          TRAP    C$ERROR
6837  031470                          ESCAPE  TST             ;SKIP TO END OF TEST
6838  031470  104410                                                          TRAP    C$ESCAPE
6839  031472  000070                                                          .WORD   L10026-.
6840
6841  031474  004537  010350          JSR     R5,RXCHAR       ;READ/CHK DATA4(377), RCV DATA5(001)
6842  031500  000377                  377
6843  031502  000000                  0
6844  031504  020010                  NCRACT!8.               ;DON'T CHECK FOR FINAL RXACT=1
6845  031506  103003                  BCC     .+8.            ;BR IF NO ERROR
6846  031510                          ERROR                   ;REPORT STACKED ERROR
6847  031510  104460                                                          TRAP    C$ERROR
6848  031512                          ESCAPE  TST             ;SKIP TO END OF TEST
6849  031512  104410                                                          TRAP    C$ESCAPE
6850  031514  000046                                                          .WORD   L10026-.
6851
6852  031516  004537  010350          JSR     R5,RXCHAR       ;READ/CHK DATA5(001), RCV FIRST FLAG
6853  031522  001001                  RXEOM!001               ; & CHECK REOM
6854  031524  000001                  RERCHK                  ; & CHECK RERR BIT=0 (GOOD CRC)
6855  031526  060000                  NFCRDA!NCRACT           ;DON'T CHECK FOR FINAL RDA=RXACT=1
6856  031530  103003                  BCC     .+8.            ;BR IF NO ERROR
6857  031532                          ERROR                   ;REPORT STACKED ERROR
6858  031532  104460                                                          TRAP    C$ERROR
```

```
                                        ESCAPE  TST             ;SKIP TO END OF TEST
                                                                                    TRAP    C$ESCAPE
                                                                                    .WORD   L10026-.
                                ;-------------------------------------------------------------------
                                        DEC     REG0            ;DECREMENT COUNT
                                        BEQ     40$             ;BR IF TRIPLE LOOP IS COMPLETED

                                        JSR     R5,TXCTRL       ;CLEAR TEOM, SET TSOM
                                        TSOM
                                        1
                                        JMP     2$              ;AND RUN TX/RX AGAIN
                                40$:
                                ENDTST
                                                                                L10026:
                                                                                    TRAP    C$ETST
```

```
                                          .SBTTL  TEST 8 -- MODEM CONTROL SIGNAL LOOPBACK TEST

                                          ;*+*********************************************************************
                                          ;*
                                          ;*       TEST 8 -- MODEM CONTROL SIGNAL LOOPBACK TEST
                                          ;*
                                          ;*  FIRST, THE DMV-11 IS INITIALIZED. THEN, TTL LOOPBACK IS SELECTED,
                                          ;*  AND THE FOLLOWING CHECKS ARE PERFORMED INVOLVING THE MODEM STATUS
                                          ;*  REGISTER :
                                          ;*  - RING, CARRIER, MODEM READY, TEST MODE, CTS ARE CHECKED FOR 1 STATE.
                                          ;*  - RTS IS DE-ASSERTED AND CTS IS CHECKED FOR 0.
                                          ;*  - RTS IS ASSERTED AND CTS IS CHECKED FOR 1.
                                          ;*
                                          ;*  NEXT, IF THE OPTION IS AN M8053 WITH AN H3254 TEST CONNECTOR INSTALLED,
                                          ;*  THE DMV-11 IN INITIALIZED AGAIN, (TTL LOOPBACK IS CLEARED), AND
                                          ;*  THE FOLLOWING CHECKS ARE PERFORMED :
                                          ;*  - RING (IF EIA), CARRIER, MODEM READY, CTS ARE CHECKED FOR 1, TEST
                                          ;*    MODE IS CHECKED FOR 0.
                                          ;*  - RTS IS DE-ASSERTED, AND CARRIER AND CTS ARE CHECKED FOR 0.
                                          ;*  - RTS IS ASSERTED, AND CARRIER AND CTS ARE CHECKED FOR 1.
                                          ;*  - DTR IS DE-ASSERTED, AND MODEM READY IS CHECKED FOR 0.
                                          ;*  - DTR IS ASSERTED, AND MODEM READY IS CHECKED FOR 1.
                                          ;*
                                          ;*--*********************************************************************
                                          ;
                                          ;       BGNTST
 031564                                                                                 T8::
 031564  012737  000010  002414                   MOV     #8.,TSTNUM        ;SET TEST NO. FOR POSSIBLE PRINTOUT
 031572  004537  007532                           JSR     R5,CKLPBK         ;CHK FOR H3254/5 INSTALLED
 031576  100000                                   TCCHEK
 031600  103002                                   BCC     2$                ;BR IF YES, TO RUN TEST
 031602                                           EXIT    TST               ;NO TEST CONNECTOR, SKIP TEST
 031602  104432                                                                                 TRAP    C$EXIT
 031604  000722                                                                                 .WORD   L10027-.
 031606                                   2$:
 031606                                           BGNSUB
 031606                                                                                 T8.1:
 031606  104402                                                                                 TRAP    C$BSUB
                                          ;INIT DMV, SET TTL LOOPBACK, CHK MODEM STATUS
 031610  004737  003352                           JSR     PC,MSTCLR         ;PERFORM MASTER CLEAR TO INIT DMV11
 031614  004537  003712                           JSR     R5,WRITEI         ;SET PORT B FOR OUTPUT MODE
 031620  120002                                   VIADPB
 031622  000377                                   377
 031624  004537  003712                           JSR     R5,WRITEI         ;SET PORT A FOR INPUT MODE
 031630  120003                                   VIADPA
 031632  000000                                   000
 031634  004537  003712                           JSR     R5,WRITEI         ;SET TTL LOOPBACK
 031640  120000                                   VIAORB
 031642  000002                                   TTLOOP
 031644  012737  000001  002336                   MOV     #1,REGNUM         ;SET REG NO. FOR PRINTOUT
                                          ;CHK FOR RING, CARRIER, MODEM RDY, CTS, TEST MODE, = 1
 031652  004537  003566                           JSR     R5,READI          ;READ MODEM STATUS
 031656  120017                                   VIAORA
 031660  000000                           4$:     .WORD   0
 031662  142737  000023  031660                   BICB    #SPEED!RCVDAT!UMAINT,4$ ;CLEAR UNNEEDED BITS
 031670  123727  031660  000354                   CMPB    4$,#RING!CARIER!MDMRDY!CTS!TM ;CHK FOR BITS SET
```

```
6930  031676  001414                          BEQ     8$                ;BR IF ALL BITS SET
6931  031700  012737  000354  002324          MOV     #RING!CARIER!MDMRDY!CTS!TM,GDATA ;SET EXPECTED DATA
6932  031706  013737  031660  002326          MOV     4$,BDATA          ;SET ACTUAL DATA
6933                                ;REPORT "MODEM STATUS INCORRECT"
6934  031714                                  GEDF    EM83,ERR11
6935                                                          ;       "DEVICE FATAL" ERROR # 66
6936  031714  104455                                                                  TRAP    C$ERDF
6937  031716  000102                                                                  .WORD   66
6938  031720  015262                                                                  .WORD   EM83
6939  031722  020540                                                                  .WORD   ERR11
6940  031724                                  ESCAPE  SUB
6941  031724  104410                                                                  TRAP    C$ESCAPE
6942  031726  000106                                                                  .WORD   L10030-.
6943                                ;DE-ASSERT RTS, CHK FOR CTS = 0
6944  031730  004537  003712            8$:     JSR     R5,WRITEI         ;DE-ASSERT RTS
6945  031734  120000                            VIAORB
6946  031736  000012                            RTSND!TTLOOP
6947  031740  004537  003566                    JSR     R5,READI          ;READ MODEM STATUS
6948  031744  120017                            VIAORA
6949  031746  000000            10$:    .WORD   0
6950  031750  132737  000010  031746            BITB    #CTS,10$          ;CHK FOR CTS = 0
6951  031756  001406                            BEQ     12$               ;BR IF YES
6952                                ;REPORT CTS NOT CLEARED
6953  031760                                  GEDF    EM84,ERR14
6954                                                          ;       "DEVICE FATAL" ERROR # 67
6955  031760  104455                                                                  TRAP    C$ERDF
6956  031762  000103                                                                  .WORD   67
6957  031764  015311                                                                  .WORD   EM84
6958  031766  021146                                                                  .WORD   ERR14
6959  031770                                  ESCAPE  SUB
6960  031770  104410                                                                  TRAP    C$ESCAPE
6961  031772  000042                                                                  .WORD   L10030-.
6962                                ;ASSERT RTS, CHK FOR CTS = 1
6963  031774  004537  003712            12$:    JSR     R5,WRITEI         ;ASSERT RTS
6964  032000  120000                            VIAORB
6965  032002  000002                            TTLOOP
6966  032004  004537  003566                    JSR     R5,READI          ;READ MODEM STATUS
6967  032010  120017                            VIAORA
6968  032012  000000            14$:    .WORD   0
6969  032014  132737  000010  032012            BITB    #CTS,14$          ;CHK FOR CTS = 1
6970  032022  001004                            BNE     15$               ;BR IF YES
6971                                ;REPORT CTS NOT SET
6972  032024                                  GEDF    EM85,ERR14
6973                                                          ;       "DEVICE FATAL" ERROR # 68
6974  032024  104455                                                                  TRAP    C$ERDF
6975  032026  000104                                                                  .WORD   68
6976  032030  015326                                                                  .WORD   EM85
6977  032032  021146                                                                  .WORD   ERR14
6978  032034                            15$:
6979  032034                                  ENDSUB
6980  032034                                                                  L10030:
6981  032034  104403                                                                  TRAP    C$ESUB
6982                                ;SEE IF BOARD IS M8053 WITH M3254 INSTALLED
6983  032036  005737  002470                    TST     BRDTYP            ;SEE IF M8053
6984  032042  001002                            BNE     17$               ;BR IF YES
6985  032044  000137  032526            16$:    JMP     A1                ;SKIP THIS SECTION OF CODE
```

```
 6986  032050  023727  002472  000000  17$:    CMP     TSTCON,#0       ;SEE IF H3254 INSTALLED
 6987  032056  001372                          BNE     16$             ;BR IF NOT, TO SKIP CODE
 6988  032060                                  BGNSUB
 6989  032060                                                                          T8.2:
 6990  032060  104402                                                                  TRAP    C$BSUB
 6991                                  ;INIT DMV, (TTL LOOPBACK IS CLEARED), CHK MODEM STATUS
 6992  032062  004737  003352                  JSR     PC,MSTCLR       ;PERFORM MASTER CLEAR TO INIT DMV11
 6993  032066  004537  003712                  JSR     R5,WRITEI       ;SET PORT B FOR OUTPUT MODE
 6994  032072  120002                          VIADPB
 6995  032074  000377                          377
 6996  032076  004537  003712                  JSR     R5,WRITEI       ;SET PORT A FOR INPUT MODE
 6997  032102  120003                          VIADPA
 6998  032104  000000                          000
 6999  032106  004537  003712                  JSR     R5,WRITEI       ;DISABLE TTLOOP
 7000  032112  120000                          VIAORB
 7001  032114  000000                          000
 7002  032116  012737  000001  002336          MOV     #1,REGNUM       ;SET REG NO. FOR PRINTOUT
 7003                                  ;-------------------------------------------------------------
 7004                                  ;CHK FOR RING (IF EIA), CARRIER, MODEM RDY, CTS = 1, TEST MODE, = 0
 7005                                  ;-------------------------------------------------------------
 7006  032124  004537  003566                  JSR     R5,READI        ;READ MODEM STATUS
 7007  032130  120017                          VIAORA
 7008  032132  000000                  18$:    .WORD   0
 7009
 7010  032134  023727  002470  000001          CMP     BRDTYP,#1       ;IS V.35 THE SELECTED I/F ?
 7011  032142  001013                          BNE     21$             ; NO: BR TO DO CHECK WITH RING
 7012                                                                  ;YES: REMOVE RING BEFORE CHECKING
 7013  032144  142737  000223  032132          BICB    #RING!SPEED!RCVDAT!UMAINT,18$ ;CLEAR UNNEEDED BITS
 7014  032152  123727  032132  000150          CMPB    18$,#CARIER!MDMRDY!CTS ;CHK FOR CORRECT STATUS
 7015  032160  001427                          BEQ     20$             ;BR IF STATUS CORRECT
 7016  032162  012737  000150  002324          MOV     #CARIER!MDMRDY!CTS,GDATA ;SET EXPECTED DATA
 7017  032170  000412                          BR      19$
 7018                                                                  ; DO CHECK WITH RING....
 7019  032172  142737  000023  032132  21$:    BICB    #SPEED!RCVDAT!UMAINT,18$ ;CLEAR UNNEEDED BITS
 7020  032200  123727  032132  000350          CMPB    18$,#RING!CARIER!MDMRDY!CTS ;CHK FOR CORRECT STATUS
 7021  032206  001414                          BEQ     20$             ;BR IF STATUS CORRECT
 7022  032210  012737  000350  002324          MOV     #RING!CARIER!MDMRDY!CTS,GDATA ;SET EXPECTED DATA
 7023
 7024                                  ;REPORT "MODEM STATUS INCORRECT"
 7025  032216  013737  032132  002326  19$:    MOV     18$,BDATA       ;SET ACTUAL DATA
 7026  032224                                  GEDF    EM83,ERR11
 7027                                                                  ;       "DEVICE FATAL" ERROR # 69
 7028  032224  104455                                                                  TRAP    C$ERDF
 7029  032226  000105                                                                  .WORD   69
 7030  032230  015262                                                                  .WORD   EM83
 7031  032232  020540                                                                  .WORD   ERR11
 7032  032234                                  ESCAPE  SUB
 7033  032234  104410                                                                  TRAP    C$ESCAPE
 7034  032236  000266                                                                  .WORD   L10031-.
 7035                                  ;DE-ASSERT RTS, CHK FOR CTS,CARRIER = 0
 7036  032240  004537  003712          20$:    JSR     R5,WRITEI       ;DE-ASSERT RTS
 7037  032244  120000                          VIAORB
 7038  032246  000010                          RTSND
 7039  032250  004537  003566                  JSR     R5,READI        ;READ MODEM STATUS
 7040  032254  120017                          VIAORA
 7041  032256  000000                  22$:    .WORD   0
```

```
 7042  032260  132737  000010  032256          BITB    #CTS,22$        ;CHK FOR CTS = 0
 7043  032266  001406                          BEQ     24$             ;BR IF YES
 7044                                  ;REPORT CTS NOT CLEARED
 7045  032270                                  GEDF    EM84,ERR14
 7046                                                  ;       "DEVICE FATAL" ERROR # 70
 7047  032270  104455                                                          TRAP    C$ERDF
 7048  032272  000106                                                          .WORD   70
 7049  032274  015311                                                          .WORD   EM84
 7050  032276  021146                                                          .WORD   ERR14
 7051  032300                                  ESCAPE  SUB
 7052  032300  104410                                                          TRAP    C$ESCAPE
 7053  032302  000222                                                          .WORD   L10031-.
 7054  032304  132737  000100  032256  24$:     BITB    #CARIER,22$     ;CHK FOR CARRIER = 0
 7055  032312  001406                          BEQ     26$             ;BR IF YES
 7056                                  ;REPORT CARRIER NOT CLEARED
 7057  032314                                  GEDF    EM86,ERR14
 7058                                                  ;       "DEVICE FATAL" ERROR # 71
 7059  032314  104455                                                          TRAP    C$ERDF
 7060  032316  000107                                                          .WORD   71
 7061  032320  015342                                                          .WORD   EM86
 7062  032322  021146                                                          .WORD   ERR14
 7063  032324                                  ESCAPE  SUB
 7064  032324  104410                                                          TRAP    C$ESCAPE
 7065  032326  000176                                                          .WORD   L10031-.
 7066                                  ;ASSERT RTS, CHK FOR CTS,CARRIER = 1
 7067  032330  004537  003712          26$:    JSR     R5,WRITEI       ;ASSERT RTS
 7068  032334  120000                          VIAORB
 7069  032336  000000                          000
 7070  032340  004537  003566                  JSR     R5,READI        ;READ MODEM STATUS
 7071  032344  120017                          VIAORA
 7072  032346  000000                  28$:    .WORD   0
 7073  032350  132737  000010  032346          BITB    #CTS,28$        ;CHK FOR CTS = 1
 7074  032356  001006                          BNE     30$             ;BR IF YES
 7075                                  ;REPORT CTS NOT SET
 7076  032360                                  GEDF    EM85,ERR14
 7077                                                  ;       "DEVICE FATAL" ERROR # 72
 7078  032360  104455                                                          TRAP    C$ERDF
 7079  032362  000110                                                          .WORD   72
 7080  032364  015326                                                          .WORD   EM85
 7081  032366  021146                                                          .WORD   ERR14
 7082  032370                                  ESCAPE  SUB
 7083  032370  104410                                                          TRAP    C$ESCAPE
 7084  032372  000132                                                          .WORD   L10031-.
 7085  032374  132737  000100  032346  30$:     BITB    #CARIER,28$     ;CHK FOR CARRIER = 1
 7086  032402  001006                          BNE     32$             ;BR IF YES
 7087                                  ;REPORT CARRIER NOT SET
 7088  032404                                  GEDF    EM87,ERR14
 7089                                                  ;       "DEVICE FATAL" ERROR # 73
 7090  032404  104455                                                          TRAP    C$ERDF
 7091  032406  000111                                                          .WORD   73
 7092  032410  015363                                                          .WORD   EM87
 7093  032412  021146                                                          .WORD   ERR14
 7094  032414                                  ESCAPE  SUB
 7095  032414  104410                                                          TRAP    C$ESCAPE
 7096  032416  000106                                                          .WORD   L10031-.
 7097                                  ;DE-ASSERT DTR, CHK FOR MODEM READY = 0
```

```
 7098  032420  004537  003712          32$:    JSR     R5,WRITEI       ;DE-ASSERT DTR
 7099  032424  120000                          VIAORB
 7100  032426  000020                          DTR
 7101  032430  004537  003566                  JSR     R5,READI        ;READ MODEM STATUS
 7102  032434  120017                          VIAORA
 7103  032436  000000                  34$:    .WORD   0
 7104  032440  132737  000040  032436          BITB    #MDMRDY,34$     ;CHK FOR MODEM READY = 0
 7105  032446  001406                          BEQ     36$             ;BR IF YES
 7106                                  ;REPORT MODEM READY NOT CLEARED
 7107  032450                                  GEDF    EM88,ERR14
 7108                                                          ;       "DEVICE FATAL" ERROR # 74
 7109  032450  104455                                                          TRAP    C$ERDF
 7110  032452  000112                                                          .WORD   74
 7111  032454  015403                                                          .WORD   EM88
 7112  032456  021146                                                          .WORD   ERR14
 7113  032460                          ESCAPE  SUB
 7114  032460  104410                                                          TRAP    C$ESCAPE
 7115  032462  000042                                                          .WORD   L10031-.
 7116                                  ;ASSERT DTR, CHK FOR MODEM READY = 1
 7117  032464  004537  003712          36$:    JSR     R5,WRITEI       ;ASSERT DTR
 7118  032470  120000                          VIAORB
 7119  032472  000000                          000
 7120  032474  004537  003566                  JSR     R5,READI        ;READ MODEM STATUS
 7121  032500  120017                          VIAORA
 7122  032502  000000                  38$:    .WORD   0
 7123  032504  132737  000040  032502          BITB    #MDMRDY,38$     ;CHK FOR MODEM READY = 1
 7124  032512  001004                          BNE     40$             ;BR IF YES
 7125                                  ;REPORT MODEM READY NOT SET
 7126  032514                                  GEDF    EM89,ERR14
 7127                                                          ;       "DEVICE FATAL" ERROR # 75
 7128  032514  104455                                                          TRAP    C$ERDF
 7129  032516  000113                                                          .WORD   75
 7130  032520  015426                                                          .WORD   EM89
 7131  032522  021146                                                          .WORD   ERR14
 7132  032524                          40$:
 7133  032524                                  ENDSUB
 7134  032524                                                          L10031:
 7135  032524  104403                                                          TRAP    C$ESUB
 7136  032526                          A1:
 7137  032526                          ENDTST
 7138  032526                                                          L10027:
 7139  032526  104401                                                          TRAP    C$ETST
```

```
                        .SBTTL  TEST 9 -- DDCMP MESSAGE TEST

                        ;++*************************************************************************
                        ;*
                        ;*      TEST 9 -- DDCMP MESSAGE TEST
                        ;*
                        ;*  THIS  TEST  WILL  USE XLB IF IT IS ENABLED -- OTHERWISE TTL LOOPBACK
                        ;*  WILL  BE  UTILIZED.  THIS  ASSURES  THAT  IT  CAN ALWAYS BE RUN AS A
                        ;*  GENERAL "RINGOUT" OF THE M8053.
                        ;*
                        ;*  INITIALIZATION:  BCP  MODE, CRC-16, IDLE = 0, SYNC (S/AR) = 226 OCT.
                        ;*  (96 HEX.), RXCL & TXCL = 0 (CHAR. LENGTH = 8).
                        ;*
                        ;*  THE FOLLOWING SAMPLE DDCMP MESSAGE IS TRANSMITTED & RECEIVED AND ALL
                        ;*  DATA AND CRC CHARACTERS ARE CHECKED FOR ERRORS:
                        ;*
                        ;*            ---------- HEADER ----------   --- DATA (PATTERN K) -----
                        ;*  SYNC SYNC 201 000 075 003 002 001 CRC CRC 000 377 ... 252 000 CRC CRC
                        ;*
                        ;*  THE  ATTEMPT  HERE  IS TO PROVIDE A TEST JUST BELOW THE LEVEL OF THE
                        ;*  FUNCTIONAL  DIAGNOSTIC.  THE  USYRT  WILL BE RESPONSIBLE FOR ALL CRC
                        ;*  GENERATION  AND  VERIFICATION BUT THE CRC'S WILL ALSO BE VERIFIED BY
                        ;*  SOFTWARE.
                        ;*
                        ;--*************************************************************************
                        ;
                        ;       BGNTST
                                                                                T9::
032530                  MOV     #3,REGO         ;INIT COUNT (TEXT TRANSMITTED 3 TIMES)
032536  004737  005376  JSR     PC,INIDMV       ;INIT DMV-11, ENTER MAINT LOOP
032542  042737  001000  032604  BIC     #NOLOOP,1$      ;
032550  023727  002470  000000  CMP     BRDTYP,#0       ;BOARD TYPE = M8064 ?
032556  001407          BEQ     2$              ; YES: SPECIFY TTLOOP (NOT XLB)
032560  023727  002472  000004  CMP     TSTCON,#4       ;IS A LOOPBACK CONNECTOR/CABLE SPECIFIED ?
032566  001403          BEQ     2$              ;BR IF NO
032570  052737  001000  032604  BIS     #NOLOOP,1$      ; YES: SPECIFY NO TTLOOP (INITRN)
                        ;-----------------------------------------------------------------------
032576  004537  007234  2$:     JSR     R5,INITRN       ;LOAD 1 SOM, CLK TX UNTIL ACTIVE
032602  065626                  DDCMP!STRIPS!IDLES!CRC16!SYNCH ;SET DDCMP, STRIP,IDLE,CRC-16, SYNCH=226
032604  000000          1$:     0                       ;USE 8 BIT CHARS
032606  103003          BCC     .+8.            ;BR IF NO ERROR
032610                  ERROR                   ;REPORT STACKED ERROR
032610  104460                                                  TRAP    C$ERROR
032612                  ESCAPE  TST             ;SKIP TO END OF TEST
032612  104410                                                  TRAP    C$ESCAPE
032614  001032                                                  .WORD   L10032-.

032616  004537  010250          JSR     R5,TXCTRL       ;SET TSOM, TX 1ST SYNCH
032622  000001                  TSOM
032624  000007                  7.
032626  004537  010250          JSR     R5,TXCTRL       ;TX 2ND SYNCH
032632  000001                  TSOM
032634  000010                  8.
032636  004537  010250          JSR     R5,TXCTRL       ;CLEAR TSOM
032642  000000                  000
032644  000000                  0
```

```
7196  032646  004537  010136          JSR     R5,TXCHAR       ;LOAD 201(HEADR1), TX 3RD SYNCH
7197  032652  000201                  201
7198  032654  000010                  8.
7199  032656  103003                  BCC     .+8.            ;BR IF NO ERROR
7200  032660                          ERROR                   ;REPORT STACKED ERROR
7201  032660  104460                                                  TRAP    C$ERROR
7202  032662                          ESCAPE  TST             ;SKIP TO END OF TEST
7203  032662  104410                                                  TRAP    C$ESCAPE
7204  032664  000762                                                  .WORD   L10032-.
7205
7206  032666  004537  010136          JSR     R5,TXCHAR       ;LOAD 000(HEADR2), TX HEADR1
7207  032672  000000                  000
7208  032674  000010                  8.
7209  032676  103003                  BCC     .+8.            ;BR IF NO ERROR
7210  032700                          ERROR                   ;REPORT STACKED ERROR
7211  032700  104460                                                  TRAP    C$ERROR
7212  032702                          ESCAPE  TST             ;SKIP TO END OF TEST
7213  032702  104410                                                  TRAP    C$ESCAPE
7214  032704  000742                                                  .WORD   L10032-.
7215
7216  032706  004537  010136          JSR     R5,TXCHAR       ;LOAD 075(HEADR3), TX HEADR2
7217  032712  000075                  075
7218  032714  000010                  8.
7219  032716  103003                  BCC     .+8.            ;BR IF NO ERROR
7220  032720                          ERROR                   ;REPORT STACKED ERROR
7221  032720  104460                                                  TRAP    C$ERROR
7222  032722                          ESCAPE  TST             ;SKIP TO END OF TEST
7223  032722  104410                                                  TRAP    C$ESCAPE
7224  032724  000722                                                  .WORD   L10032-.
7225
7226  032726  004537  010136          JSR     R5,TXCHAR       ;LOAD 003(HEADR4), TX HEADR3
7227  032732  000003                  003
7228  032734  000010                  8.
7229  032736  103003                  BCC     .+8.            ;BR IF NO ERROR
7230  032740                          ERROR                   ;REPORT STACKED ERROR
7231  032740  104460                                                  TRAP    C$ERROR
7232  032742                          ESCAPE  TST             ;SKIP TO END OF TEST
7233  032742  104410                                                  TRAP    C$ESCAPE
7234  032744  000702                                                  .WORD   L10032-.
7235
7236  032746  004537  010136          JSR     R5,TXCHAR       ;LOAD 002(HEADR5)
7237  032752  000002                  002
7238  032754  000000                  0
7239  032756  103003                  BCC     .+8.            ;BR IF NO ERROR
7240  032760                          ERROR                   ;REPORT STACKED ERROR
7241  032760  104460                                                  TRAP    C$ERROR
7242  032762                          ESCAPE  TST             ;SKIP TO END OF TEST
7243  032762  104410                                                  TRAP    C$ESCAPE
7244  032764  000662                                                  .WORD   L10032-.
7245
7246  032766  004537  011624          JSR     R5,RCV1ST       ;CLOCK AND RCV 201
7247  032772  000000                  0
7248  032774  103003                  BCC     .+8.            ;BR IF NO ERROR
7249  032776                          ERROR                   ;REPORT STACKED ERROR
7250  032776  104460                                                  TRAP    C$ERROR
7251  033000                          ESCAPE  TST             ;SKIP TO END OF TEST
```

```
7252  033000  104410                                                  TRAP    C$ESCAPE
7253  033002  000644                                                  .WORD   L10032-.
7254
7255  033004  004537  010350          JSR     R5,RXCHAR       ;READ & CHK 201(HEADR1), RCV HEADR2
7256  033010  000201                  201
7257  033012  000000                  0
7258  033014  000010                  8.
7259  033016  103003                  BCC     .+8.            ;BR IF NO ERROR
7260  033020                          ERROR                   ;REPORT STACKED ERROR
7261  033020  104460                                                  TRAP    C$ERROR
7262  033022                          ESCAPE  TST             ;SKIP TO END OF TEST
7263  033022  104410                                                  TRAP    C$ESCAPE
7264  033024  000622                                                  .WORD   L10032-.
7265
7266  033026  004537  010136          JSR     R5,TXCHAR       ;LOAD 001(HEADR6)
7267  033032  000001                  001
7268  033034  000000                  0
7269  033036  103003                  BCC     .+8.            ;BR IF NO ERROR
7270  033040                          ERROR                   ;REPORT STACKED ERROR
7271  033040  104460                                                  TRAP    C$ERROR
7272  033042                          ESCAPE  TST             ;SKIP TO END OF TEST
7273  033042  104410                                                  TRAP    C$ESCAPE
7274  033044  000602                                                  .WORD   L10032-.
7275
7276  033046  004537  010350          JSR     R5,RXCHAR       ;READ & CHK 000(HEADR2), RCV HEADR3
7277  033052  000000                  000
7278  033054  000000                  0
7279  033056  000010                  8.
7280  033060  103003                  BCC     .+8.            ;BR IF NO ERROR
7281  033062                          ERROR                   ;REPORT STACKED ERROR
7282  033062  104460                                                  TRAP    C$ERROR
7283  033064                          ESCAPE  TST             ;SKIP TO END OF TEST
7284  033064  104410                                                  TRAP    C$ESCAPE
7285  033066  000560                                                  .WORD   L10032-.
7286
7287  033070  004537  010250          JSR     R5,TXCTRL       ;SET TEOM
7288  033074  000002                  TEOM                    ;(STARTS CRC-16 CHARACTER)
7289  033076  000000                  0
7290  033100  004537  010350          JSR     R5,RXCHAR       ;READ & CHK 075(HEADR3), RCV HEADR4
7291  033104  000075                  075
7292  033106  000000                  0
7293  033110  000010                  8.
7294  033112  103003                  BCC     .+8.            ;BR IF NO ERROR
7295  033114                          ERROR                   ;REPORT STACKED ERROR
7296  033114  104460                                                  TRAP    C$ERROR
7297  033116                          ESCAPE  TST             ;SKIP TO END OF TEST
7298  033116  104410                                                  TRAP    C$ESCAPE
7299  033120  000526                                                  .WORD   L10032-.
7300
7301  033122  004537  010350          JSR     R5,RXCHAR       ;READ & CHK 003(HEADR4), RCV HEADR5
7302  033126  000003                  003
7303  033130  000000                  0
7304  033132  000010                  8.
7305  033134  103003                  BCC     .+8.            ;BR IF NO ERROR
7306  033136                          ERROR                   ;REPORT STACKED ERROR
7307  033136  104460                                                  TRAP    C$ERROR
```

```
7308  033140                          ESCAPE  TST             ;SKIP TO END OF TEST
7309  033140  104410                                                  TRAP    C$ESCAPE
7310  033142  000504                                                  .WORD   L10032-.
7311
7312  033144  004537  010250          JSR     R5,TXCTRL       ;CLEAR TEOM
7313  033150  000000                  000
7314  033152  000000                  0
7315                                  ;---------------------------------------------------------------------
7316  033154  004537  010136          JSR     R5,TXCHAR       ;LOAD 000(DATA1)
7317  033160  000000                  000
7318  033162  000000                  0
7319  033164  103003                  BCC     .+8.            ;BR IF NO ERROR
7320  033166                          ERROR                   ;REPORT STACKED ERROR
7321  033166  104460                                                  TRAP    C$ERROR
7322  033170                          ESCAPE  TST             ;SKIP TO END OF TEST
7323  033170  104410                                                  TRAP    C$ESCAPE
7324  033172  000454                                                  .WORD   L10032-.
7325
7326  033174  004537  010350          JSR     R5,RXCHAR       ;READ & CHK 002(HEADR5), RCV HEADR6
7327  033200  000002                  002
7328  033202  000000                  0
7329  033204  000010                  8.
7330  033206  103003                  BCC     .+8.            ;BR IF NO ERROR
7331  033210                          ERROR                   ;REPORT STACKED ERROR
7332  033210  104460                                                  TRAP    C$ERROR
7333  033212                          ESCAPE  TST             ;SKIP TO END OF TEST
7334  033212  104410                                                  TRAP    C$ESCAPE
7335  033214  000432                                                  .WORD   L10032-.
7336
7337  033216  004537  010136          JSR     R5,TXCHAR       ;LOAD 377(DATA2)
7338  033222  000377                  377
7339  033224  000000                  0
7340  033226  103003                  BCC     .+8.            ;BR IF NO ERROR
7341  033230                          ERROR                   ;REPORT STACKED ERROR
7342  033230  104460                                                  TRAP    C$ERROR
7343  033232                          ESCAPE  TST             ;SKIP TO END OF TEST
7344  033232  104410                                                  TRAP    C$ESCAPE
7345  033234  000412                                                  .WORD   L10032-.
7346
7347  033236  004537  010350          JSR     R5,RXCHAR       ;READ/CHK 001(HEADR6), "RCV" FIRST CRC BYTE
7348  033242  100001                  RXERR!001
7349  033244  000001                  RERCHK
7350  033246  000010                  8.
7351  033250  103003                  BCC     .+8.            ;BR IF NO ERROR
7352  033252                          ERROR                   ;REPORT STACKED ERROR
7353  033252  104460                                                  TRAP    C$ERROR
7354  033254                          ESCAPE  TST             ;SKIP TO END OF TEST
7355  033254  104410                                                  TRAP    C$ESCAPE
7356  033256  000370                                                  .WORD   L10032-.
7357
7358  033260  004537  010136          JSR     R5,TXCHAR       ;LOAD 376(DATA3)
7359  033264  000376                  376
7360  033266  000000                  0
7361  033270  103003                  BCC     .+8.            ;BR IF NO ERROR
7362  033272                          ERROR                   ;REPORT STACKED ERROR
7363  033272  104460                                                  TRAP    C$ERROR
```

```
7364  033274                                ESCAPE  TST             ;SKIP TO END OF TEST
7365  033274  104410                                                                TRAP    C$ESCAPE
7366  033276  000350                                                                .WORD   L10032-.
7367
7368  033300  004537  010350               JSR     R5,RXCHAR       ;READ & CHK 1ST CRC BYTE, RCV SECOND CRC BYTE
7369  033304  000043                       043
7370  033306  000000                       0
7371  033310  000010                       8.
7372  033312  103003                       BCC     .+8.            ;BR IF NO ERROR
7373  033314                               ERROR                   ;REPORT STACKED ERROR
7374  033314  104460                                                                TRAP    C$ERROR
7375  033316                               ESCAPE  TST             ;SKIP TO END OF TEST
7376  033316  104410                                                                TRAP    C$ESCAPE
7377  033320  000326                                                                .WORD   L10032-.
7378
7379  033322  004537  010136               JSR     R5,TXCHAR       ;LOAD 375(DATA4)
7380  033326  000375                       375
7381  033330  000000                       0
7382  033332  103003                       BCC     .+8.            ;BR IF NO ERROR
7383  033334                               ERROR                   ;REPORT STACKED ERROR
7384  033334  104460                                                                TRAP    C$ERROR
7385  033336                               ESCAPE  TST             ;SKIP TO END OF TEST
7386  033336  104410                                                                TRAP    C$ESCAPE
7387  033340  000306                                                                .WORD   L10032-.
7388
7389  033342  004537  010350               JSR     R5,RXCHAR       ;READ & CHK SECOND CRC BYTE; RCV DATA1
7390  033346  000035                       035
7391  033350  000000                       0
7392  033352  000010                       8.
7393  033354  103003                       BCC     .+8.            ;BR IF NO ERROR
7394  033356                               ERROR                   ;REPORT STACKED ERROR
7395  033356  104460                                                                TRAP    C$ERROR
7396  033360                               ESCAPE  TST             ;SKIP TO END OF TEST
7397  033360  104410                                                                TRAP    C$ESCAPE
7398  033362  000264                                                                .WORD   L10032-.
7399
7400                                       ;-------------------------------------------------------------------
7401                                       ; TRANSMIT THE BULK OF DATA OUT OF TABLE "PATK"
7402                                       ;-------------------------------------------------------------------
7403  033364  012702  003012               MOV     #PATK,R2        ;SET UP TABLE POINTER
7404  033370  112237  033426       5$:     MOVB    (R2)+,20$       ;SET UP EXPECTED RX CHARACTER
7405  033374  116237  000003  033406       MOVB    3(R2),10$       ;SET UP TRANSMIT CHARACTER
7406
7407  033402  004537  010136               JSR     R5,TXCHAR       ;LOAD A CHARACTER
7408  033406  000000               10$:    000                     ;** HOLE FOR NEXT TX CHARACTER
7409  033410  000000                       0
7410  033412  103003                       BCC     .+8.            ;BR IF NO ERROR
7411  033414                               ERROR                   ;REPORT STACKED ERROR
7412  033414  104460                                                                TRAP    C$ERROR
7413  033416                               ESCAPE  TST             ;SKIP TO END OF TEST
7414  033416  104410                                                                TRAP    C$ESCAPE
7415  033420  000226                                                                .WORD   L10032-.
7416
7417  033422  004537  010350               JSR     R5,RXCHAR       ;CLK/RECEIVE/CHECK PREVIOUS CHARACTER
7418  033426  000000               20$:    000                     ;** HOLE FOR EXPECTED CHARACTER
7419  033430  000000                       0
```

```
7420  033432  000010                    8.
7421  033434  103003                    BCC     .+8.            ;BR IF NO ERROR
7422  033436                            ERROR                   ;REPORT STACKED ERROR
7423  033436  104460                                                    TRAP    C$ERROR
7424  033440                            ESCAPE  TST             ;SKIP TO END OF TEST
7425  033440  104410                                                    TRAP    C$ESCAPE
7426  033442  000204                                                    .WORD   L10032-.
7427
7428  033444  022702  003027            CMP     @PATK+13.,R2    ;CHECK FOR 14TH CHARACTER OF TABLE
7429  033450  001347                    BNE     5$              ;BR IF NOT DONE
7430                                  ;-----------------------------------------------------------------
7431  033452  004537  010250            JSR     R5,TXCTRL       ;SET TEOM
7432  033456  000002                    TEOM
7433  033460  000000                    0
7434  033462  004537  010350            JSR     R5,RXCHAR       ;READ/CHK 200(DATA13), RCV 125(DATA14)
7435  033466  000200                    200
7436  033470  000000                    0
7437  033472  000010                    8.
7438  033474  103003                    BCC     .+8.            ;BR IF NO ERROR
7439  033476                            ERROR                   ;REPORT STACKED ERROR
7440  033476  104460                                                    TRAP    C$ERROR
7441  033500                            ESCAPE  TST             ;SKIP TO END OF TEST
7442  033500  104410                                                    TRAP    C$ESCAPE
7443  033502  000144                                                    .WORD   L10032-.
7444
7445  033504  004537  010250            JSR     R5,TXCTRL       ;SET TEOM
7446  033510  000002                    TEOM
7447  033512  000000                    0
7448  033514  004537  010350            JSR     R5,RXCHAR       ;READ/CHK 125(DATA14), RCV 252(DATA15)
7449  033520  000125                    125
7450  033522  000000                    0
7451  033524  000010                    8.
7452  033526  103003                    BCC     .+8.            ;BR IF NO ERROR
7453  033530                            ERROR                   ;REPORT STACKED ERROR
7454  033530  104460                                                    TRAP    C$ERROR
7455  033532                            ESCAPE  TST             ;SKIP TO END OF TEST
7456  033532  104410                                                    TRAP    C$ESCAPE
7457  033534  000112                                                    .WORD   L10032-.
7458
7459  033536  004537  010350            JSR     R5,RXCHAR       ;READ/CHK 252(DATA15), RCV 000(DATA16)
7460  033542  000252                    252
7461  033544  000000                    0
7462  033546  000010                    8.
7463  033550  103003                    BCC     .+8.            ;BR IF NO ERROR
7464  033552                            ERROR                   ;REPORT STACKED ERROR
7465  033552  104460                                                    TRAP    C$ERROR
7466  033554                            ESCAPE  TST             ;SKIP TO END OF TEST
7467  033554  104410                                                    TRAP    C$ESCAPE
7468  033556  000070                                                    .WORD   L10032-.
7469
7470  033560  004537  010350            JSR     R5,RXCHAR       ;READ/CHK 000(DATA16), RCV FIRST CRC BYTE
7471  033564  100000                    RXERR!000
7472  033566  000001                    RERCHK
7473  033570  000010                    8.
7474  033572  103003                    BCC     .+8.            ;BR IF NO ERROR
7475  033574                            ERROR                   ;REPORT STACKED ERROR
```

```
7476  033574  104460                                                          TRAP    C$ERROR
7477  033576                        ESCAPE  TST             ;SKIP TO END OF TEST
7478  033576  104410                                                          TRAP    C$ESCAPE
7479  033600  000046                                                          .WORD   L10032-.
7480
7481  033602  004537  010350        JSR     R5,RXCHAR       ;READ & CHK 1ST CRC BYTE, RCV SECOND CRC BYTE
7482  033606  000231                231
7483  033610  000000                0
7484  033612  000010                8.
7485  033614  103003                BCC     .+8.            ;BR IF NO ERROR
7486  033616                        ERROR                   ;REPORT STACKED ERROR
7487  033616  104460                                                          TRAP    C$ERROR
7488  033620                        ESCAPE  TST             ;SKIP TO END OF TEST
7489  033620  104410                                                          TRAP    C$ESCAPE
7490  033622  000024                                                          .WORD   L10032-.
7491
7492  033624  004537  010350        JSR     R5,RXCHAR       ;READ & CHK 2ND CRC BYTE, RCV 1ST SYNCH
7493  033630  000176                176
7494  033632  000000                0
7495  033634  000010                8.
7496  033636  103003                BCC     .+8.            ;BR IF NO ERROR
7497  033640                        ERROR                   ;REPORT STACKED ERROR
7498  033640  104460                                                          TRAP    C$ERROR
7499  033642                        ESCAPE  TST             ;SKIP TO END OF TEST
7500  033642  104410                                                          TRAP    C$ESCAPE
7501  033644  000002                                                          .WORD   L10032-.
7502  033646                ENDTST
7503  033646                                                        L10032:
7504  033646  104401                                                          TRAP    C$ETST
```

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

033650                                  BGNHRD
033650  000027                                                        .WORD L10033-L$HARD/2
033652                                                          L$HARD::
033652                                  GPRMA   ADDRES,0,0,160020,177776,YES
033652  000031                                                      .WORD   T$CODE
033654  033730                                                      .WORD   ADDRES
033656  160020                                                      .WORD   T$LOLIM
033660  177776                                                      .WORD   T$HILIM
033662                                  GPRMA   VECTOR,2,0,0,674,YES
033662  001031                                                      .WORD   T$CODE
033664  033756                                                      .WORD   VECTOR
033666  000000                                                      .WORD   T$LOLIM
033670  000674                                                      .WORD   T$HILIM
033672                                  GPRMD   PRIRTY,4,0,7000,4,7,YES
033672  002032                                                      .WORD   T$CODE
033674  034007                                                      .WORD   PRIRTY
033676  007000                                                      .WORD   7000
033700  000004                                                      .WORD   T$LOLIM
033702  000007                                                      .WORD   T$HILIM
033704                                  GPRMD   BDTY.M,12,0,7,0,2,YES
033704  005032                                                      .WORD   T$CODE
033706  034040                                                      .WORD   BDTY.M
033710  000007                                                      .WORD   7
033712  000000                                                      .WORD   T$LOLIM
033714  000002                                                      .WORD   T$HILIM
033716                                  GPRMD   TCON.M,14,0,7,0,4,YES
033716  006032                                                      .WORD   T$CODE
033720  034123                                                      .WORD   TCON.M
033722  000007                                                      .WORD   7
033724  000000                                                      .WORD   T$LOLIM
033726  000004                                                      .WORD   T$HILIM

033730                                  ENDHRD
                                                                .EVEN
033730                                                          L10033:

                                .NLIST  BEX
```

```
        033730  042504  044526  042503  ADDRES: .ASCIZ  /DEVICE CSR ADDRESS : /
        033756  042504  044526  042503  VECTOR: .ASCIZ  /DEVICE VECTOR ADDRESS : /
        034007     104  053105  041511  PRIRTY: .ASCIZ  /DEVICE PRIORITY LEVEL : /
        034040  047502  051101  020104  BDTY.M: .ASCIZ  /BOARD TYPE (0=M8064, 1=M8053-V.35, 2=M8053-EIA) : /
        034123     124  051125  040516  TCON.M: .ASCII  /TURNAROUND CONNECTOR TYPE -/<15><12>
        034160  030050  044075  031063          .ASCII  /(0=H3254&H3255, 1=INTEGRAL MODEM CABLE, 2=EIA CABLE,/<15><12>
        034246  031440  053075  031456          .ASCIZ  / 3=V.35 CABLE, 4=NONE) : /
                                        .LIST   BEX
  7556                                  .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.
                                ;//////////////////////////////////////////////////////////////////////

034300                                  BGNSFT
034300  000000                                                          .WORD L10034-L$SOFT/2
034302                                                          L$SOFT::
034302                                  ENDSFT
034302                                                          .EVEN
034302                                                          L10034:
```

```
                                ****** PATCH AREA FOR DEBUG ******

                                .SBTTL ****** PATCH AREA FOR DEBUG ******

034302                          PATCH:
        034502                          .=.+200
034502  000240                          NOP
034504  000240                          NOP
034506  000240                          NOP
                                ;**********************************

                                .SBTTL  "ENDMOD" STATEMENT

034510                          ENDMOD

                                .SBTTL  "LASTAD" STATEMENT & END OF PROGRAM
034510                          LASTAD
                                                                        .EVEN
034510  000000                                                          .WORD   0
034512  000000                                                          .WORD   0
034514                          L$LAST::

        000001                  .END
```

```
ABC    = 000160           1269#
ADDRES  033730            7524    7555#
ADR    = 000020 G         1201#
AD.MIT  023214            4538    4573#
AD.OK   023210            4562    4567#
APA    = 000200           1325#
APAD   = 100000           1334#
ASSEMB= 000010             959
A1      032526            6985    7136#
BADDAT  002366            1720#
BDATA   002326            1703#   2356*  2359   2362   2636*  2739*  2740*  3507*  3508*  3525*  3526*  3919   3968
                          4013    4084   4146   4805*  4806*  4888*  5013*  5042*  5071*  5100*  5129*  5171*  5200*
                          6932*   7025*
BDRATE  002474            1767#   4506*
BDTY.M  034040            7540    7555#
BIT0   = 000001 G         1174#   1219   1231   1273   1282   1301   1330   1356   1372   1390   1406   1548   1562
                          1584    1637   2770   2815   2860   2905   2950   2993   3040   3107   4472
BIT00  = 000001 G         1163#   1174
BIT01  = 000002 G         1162#   1173
BIT02  = 000004 G         1161#   1172
BIT03  = 000010 G         1160#   1171
BIT04  = 000020 G         1159#   1170
BIT05  = 000040 G         1158#   1169
BIT06  = 000100 G         1157#   1168
BIT07  = 000200 G         1156#   1167
BIT08  = 000400 G         1155#   1166
BIT09  = 001000 G         1154#   1165
BIT1   = 000002 G         1173#   1272   1300   1330   1356   1371   1389   1405   1547   1561   1583   1636   3064
BIT10  = 002000 G         1153#   1278   1306   1341   1342   1343
BIT11  = 004000 G         1152#   1277   1305   1338
BIT12  = 010000 G         1151#   1337
BIT13  = 020000 G         1150#   1336   1646
BIT14  = 040000 G         1149#   1335   1639   1645
BIT15  = 100000 G         1148#   1276   1304   1334   1633   1644   5830   6090   6315
BIT2   = 000004 G         1172#   1271   1299   1330   1356   1370   1388   1404   1536   1561   1582
BIT3   = 000010 G         1171#   1270   1298   1329   1355   1369   1387   1403   1536   1561   1581
BIT4   = 000020 G         1170#   1218   1269   1328   1354   1368   1386   1402   1536   1560   1580
BIT5   = 000040 G         1169#   1269   1327   1353   1367   1385   1401   1531   1559   1579   3649
BIT6   = 000100 G         1168#   1230   1269   1326   1353   1366   1384   1400   1521   1559   1578   3669
BIT7   = 000200 G         1167#   1229   1237   1268   1297   1325   1353   1365   1383   1399   1521   1559   1572
                          1594    1642   3486   3487   3658
BIT8   = 000400 G         1166#   1280   1308   1339   1340   1341   1342
BIT9   = 001000 G         1165#   1279   1307   1340   1341   1640
BOE    = 000400 G         1205#
BRDTYP  002470            1765#   3267   3278   3286   3296   4504*  5825   6085   6310   6530   6715   6983   7010
                          7171
BSEL0   002416            1734#   2298   4545   4551
BSEL1   002420            1737#   2094*  2299
BSEL10  002436            1747#   2306
BSEL11  002440            1749#   2307
BSEL12  002442            1750#   2308
BSEL13  002444            1752#   2309
BSEL14  002446            1753#   2310
BSEL15  002450            1755#   2311
BSEL16  002452            1756#   2312
BSEL17  002454            1758#   2313   4494
```

```
BSEL2   002422          1738#  2101   2137*  2144   2184*  2191   2256*  2263   2300   4862*  4868
BSEL3   002424          1740#  2301
BSEL4   002426          1741#  2302
BSEL5   002430          1743#  2303
BSEL6   002432          1744#  2159   2304   4883   4890   4903   4916   4929   4943   4956   4969   4982   4995
                        5008   5024   5037   5053   5066   5082   5095   5111   5124   5140   5153   5166   5182
                        5195   5211   5224
BSEL7   002434          1746#  2305   5013   5042   5071   5100   5129   5171   5200
BSR0    002202          1670#  2298*  4168
BSR1    002204          1672#  2299*  4167
BSR10   002222          1685#  2306*  4202
BSR11   002224          1686#  2307*  4201
BSR12   002226          1687#  2308*  4200
BSR13   002230          1688#  2309*  4199
BSR14   002232          1689#  2310*  4219
BSR15   002234          1690#  2311*  4218
BSR16   002236          1691#  2312*  4217
BSR17   002240          1692#  2313*  4216
BSR2    002206          1674#  2300*  4166
BSR3    002210          1676#  2301*  4165
BSR4    002212          1678#  2302*  4185
BSR5    002214          1680#  2303*  4184
BSR6    002216          1682#  2304*  4183
BSR7    002220          1684#  2305*  4182
CARIER= 000100          1400#  6929   6931   7014   7016   7020   7022   7054   7085
CA1CTL= 000001          1562#
CA2CTL= 000016          1561#
CB1CTL= 000020          1560#
CB2CTL= 000340          1559#
CHKTSO  007074          3102#
CHPTYP  002400          1725#  4421*
CKLPBK  007532          3246#  4774   6902
CKRACT  005654          2810#  3651   3705   3732   3764   3775
CKRDA   006154          2900#  3660   3671   3708   3724   3729
CKROR   006454          2988#
CKRSA   006314          2945#
CKSEOM  006614          3035#  3711
CKTACT  005514          2765#  3217   3383   3435   3761   3772
CKTBMT  006014          2855#  3200   3214   3392   3399   3440   3447   4850
CKUSTS  005410          2730#  3183   4836
CRC05 = 000400          1339#  6722
CRC16 = 001400          1340#  4831   5833   7178
CTS   = 000010          1403#  6929   6931   6950   6969   7014   7016   7020   7022   7042   7073
C$AU  = 000052          9590   4617
C$AUTO= 000061          9590   4571
C$BRK = 000022          9590
C$BSEG= 000004          9590
C$BSUB= 000002          9590   6911   6990
C$CEFG= 000045          9590
C$CLCK= 000062          9590
C$CLEA= 000012          9590   4589
C$CLOS= 000035          9590
C$CLP1= 000006          9590
C$CVEC= 000036          9590   4560
C$DCLN= 000044          9590
C$DODU= 000051          9590   4565
```

CROSS REFERENCE TABLE -- USER SYMBOLS

```
C$DRPT= 000024   9590#
C$DU  = 000053   9590#  4604
C$EDIT= 000003   9590#  1031
C$ERDF= 000055   9590#  4810  4875  4895  4908  4921  4935  4948  4961  4974  4987  5000  5016
                 5029   5045  5058  5074  5087  5103  5116  5132  5145  5158  5174  5187  5203
                 5216   5230  5241  6936  6955  6974  7028  7047  7059  7078  7090  7109  7128
C$ERHR= 000056   9590#
C$ERRO= 000060   9590#  4643  4653  4675  4687  4700  4710  4723  4734  4745  4840  4854  5837
                 5847   5857  5871  5881  5891  5901  5911  5920  5931  5947  5958  5975  5989
                 6000   6011  6022  6033  6050  6098  6108  6118  6132  6142  6152  6161  6172
                 6188   6199  6212  6223  6233  6244  6255  6266  6275  6322  6332  6342  6356
                 6366   6376  6385  6396  6412  6423  6436  6447  6457  6468  6479  6490  6499
                 6541   6563  6573  6583  6593  6603  6616  6627  6642  6653  6664  6675  6726
                 6748   6758  6768  6778  6788  6800  6811  6825  6836  6847  6858  7182  7201
                 7211   7221  7231  7241  7250  7261  7271  7282  7296  7307  7321  7332  7342
                 7353   7363  7374  7384  7395  7412  7423  7440  7454  7465  7476  7487  7498
C$ERSF= 000054   9590#
C$ERSO= 000057   9590#
C$ESCA= 000010   9590#  4645  4655  4677  4689  4702  4712  4725  4736  4747  4815  4842  4856
                 4880   4900  4913  4926  4940  4953  4966  4979  4992  5005  5021  5034  5050
                 5063   5079  5092  5108  5121  5137  5150  5163  5179  5192  5208  5221  5235
                 5839   5849  5859  5873  5883  5893  5903  5913  5922  5933  5949  5960  5977
                 5991   6002  6013  6024  6035  6052  6100  6110  6120  6134  6144  6154  6163
                 6174   6190  6201  6214  6225  6235  6246  6257  6268  6277  6324  6334  6344
                 6358   6368  6378  6387  6398  6414  6425  6438  6449  6459  6470  6481  6492
                 6501   6543  6565  6575  6585  6595  6605  6618  6629  6644  6655  6666  6677
                 6728   6750  6760  6770  6780  6790  6802  6813  6827  6838  6849  6860  6941
                 6960   7033  7052  7064  7083  7095  7114  7184  7203  7213  7223  7233  7243
                 7252   7263  7273  7284  7298  7309  7323  7334  7344  7355  7365  7376  7386
                 7397   7414  7425  7442  7456  7467  7478  7489  7500
C$ESEG= 000005   9590#
C$ESUB= 000003   9590#  6981  7135
C$ETST= 000001   9590#  4751  5249  6056  6281  6505  6690  6873  7139  7504
C$EXIT= 000032   9590#  4778  6906
C$GETB= 000026   9590#
C$GETW= 000027   9590#
C$GMAN= 000043   9590#
C$GPHR= 000042   9590#  4480
C$GPLO= 000030   9590#
C$GPRI= 000040   9590#
C$INIT= 000011   9590#  4516
C$INLP= 000020   9590#
C$MANI= 000050   9590#
C$MEM = 000031   9590#
C$MSG = 000023   9590#  3861  3900  3934  3978  4023  4058  4093  4128
C$OPEN= 000034   9590#
C$PNTB= 000014   9590#  3857  3914  3924  3930  3947  3953  3963  3973  3992  3998  4008  4018
                 4037   4043  4053  4072  4079  4089  4107  4113  4123  4271
C$PNTF= 000017   9590#  3308  3319  3330  3348
C$PNTS= 000016   9590#
C$PNTX= 000015   9590#  3877  3893  4162  4172  4179  4189  4196  4206  4213  4223  4238  4248
                 4255   4265  4287  4297  4304  4314  4321  4331  4338  4348  4364  4374  4381
                 4391
C$QIO = 000377   9590#
C$RDBU= 000007   9590#
C$REFG= 000047   9590#  4438  4445  4452  4459
```

```
C$RESE= 000033            9590#  4509    4601
C$REVI= 000003            9590#  1030
C$RFLA= 000021            9590#
C$RPT = 000025            9590#
C$SEFG= 000046            9590#
C$SPRI= 000041            9590#
C$SVEC= 000037            9590#  4541
C$TPRI= 000013            9590#
DDCMP = 040000           13350#  4639    4831    5833    6094    6318    7178
DEVMAP  002404           17270#  4468*   4486*
DEVPTR  002406           17280#  4472*   4484*   4486    4487*
DFPTBL  002150 G         11070#
DIAGMC= 000000             959
DOTBMT= 000007           12470#
DTR   = 000020           13860#  2618    2621    2694    3156    3159    4824    4827    7100
DTRL  = 000000           13910#
D.BUG = 000000           16480#
EF.CON= 000036 G         11610#  4458
EF.NEW= 000035 G         11820#  4451
EF.PWR= 000034 G         11830#
EF.RES= 000037 G         11800#  4444
EF.STA= 000040 G         11790#  4437
EIAV35= 000002           16360#  3262
EM100   015536            3116   38160#
EM101   015556            3128   38160#
EM14    014324            3573   38160#
EM16    014340            3563   38160#
EM2     014214            2642   38160#
EM25    014360            2370   38160#
EM28    014406            3060   3632    38160#
EM29    014427            3049   3642    38160#
EM3     014263            2109   38160#
EM30    014444            3084   3609    38160#
EM31    014465            3073   3619    38160#
EM34    014502            3514   38160#  5018    5047    5076    5105    5134    5176    5205
EM35    014530            3540   38160#
EM36    014551            3550   38160#  5147
EM39    014566            3586   38160#
EM4     014307            2153   2200    2271    38160#  4877
EM40    014610            3596   38160#
EM54    014626            3501   38160#
EM68    014650            2746   38160#
EM69    014677            2779   38160#
EM70    014715            2790   38160#
EM71    014737            2824   38160#
EM72    014755            2835   38160#
EM73    014777            2869   38160#  4897    4910    4923    4950    4963    4976    4989
EM74    015014            2880   38160#
EM75    015035            2914   38160#  5002    5031    5060    5089    5118    5160    5189    5218
EM76    015051            2925   38160#
EM77    015071            2959   38160#
EM78    015105            2970   38160#
EM79    015125           38160#  4812
EM80    015161           38160#  4937
EM81    015201           38160#  5232
EM82    015225           38160#  5243
```

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EM83    015262          3816#   6938    7030
EM84    015311          3816#   6957    7049
EM85    015326          3816#   6976    7080
EM86    015342          3816#   7061
EM87    015363          3816#   7092
EM88    015403          3816#   7111
EM89    015426          3816#   7130
EM90    015450          3002    3816#
EM91    015501          3013    3816#
ENDCOD  026235          4790    4818    5794#
ENDEMB  012116          3816#   3854    3927    4268
ENDIT   023074          4461    4513#
ENDPAT  003064          2026#
ENTRAN  011772          3755#   6046    6271    6495
EPATX   002740          1926#   6204    6428
ERRBLK  002200 G        1664#   2110*   2154*   2201*   2272*   2371*   2643*   2747*   2780*   2791*   2825*   2836*   2870*
                        2881*   2915*   2926*   2960*   2971*   3003*   3014*   3050*   3061*   3074*   3085*   3117*   3129*
                        3502*   3515*   3541*   3551*   3564*   3574*   3587*   3597*   3610*   3620*   3633*   3643*
ERRFLG  002350          1713#
ERRMSG  002176 G        1663#   2109*   2153*   2200*   2271*   2370*   2642*   2746*   2779*   2790*   2824*   2835*   2869*
                        2880*   2914*   2925*   2959*   2970*   3002*   3013*   3049*   3060*   3073*   3084*   3116*   3128*
                        3501*   3514*   3540*   3550*   3563*   3573*   3586*   3596*   3609*   3619*   3632*   3642*
ERRNBR  002174 G        1662#   2108*   2152*   2199*   2270*   2369*   2641*   2745*   2778*   2789*   2823*   2834*   2868*
                        2879*   2913*   2924*   2958*   2969*   3001*   3012*   3048*   3059*   3072*   3083*   3115*   3127*
                        3500*   3513*   3539*   3549*   3562*   3572*   3585*   3595*   3608*   3618*   3631*   3641*
ERROR1  002376          1724#   4422*
ERRTYP  002172 G        1661#   2107*   2151*   2198*   2269*   2368*   2640*   2744*   2777*   2788*   2822*   2833*   2867*
                        2878*   2912*   2923*   2957*   2968*   3000*   3011*   3047*   3058*   3071*   3082*   3114*   3126*
                        3499*   3512*   3538*   3548*   3561*   3571*   3584*   3594*   3607*   3617*   3630*   3640*
ERR10   020364 G        2643    2747    3515    3940#   5019    5048    5077    5106    5135    5148    5177    5206
ERR11   020540 G        3985#   6939    7031
ERR11$  022032          4020    4125    4280#
ERR12   020714 G        2780    2791    2825    2836    2870    2881    2915    2926    2960    2971    3003    3014    3050
                        3061    3074    3085    3117    3129    3502    3541    3551    3564    3574    3587    3597    3610
                        3620    3633    3643    4030#   4898    4911    4924    4951    4964    4977    4990    5003    5032
                        5061    5090    5119    5161    5190    5219
ERR12$  022364          3975    4055    4357#
ERR13   021030 G        4065#   4813
ERR14   021146 G        4100#   4938    5233    6958    6977    7050    7062    7081    7093    7112    7131
ERR3    020072 G        3851#   5244
ERR4    020120 G        2110    2154    2201    2272    3866#   4878
ERR4$   021306          3852    4156#
ERR5$   021634          3897    4231#
ERR7A   020244 G        2371    3905#
EVL     = 000004 G      1199#
EVRC    = 002400        1342#   6318
EXADD   = 000020        1354#
EXCON   = 000010        1355#
EXECUT  = 000005        1246#   4862    4871
E$END   = 002100         959#
E$LOAD  = 000035         959#   1054
FLGCA1  = 000002        1583#
FLGCA2  = 000001        1584#
FLGCB1  = 000020        1580#
FLGCB2  = 000010        1581#
FLGIRQ  = 000200        1572#
```

```
FLGSR = 000004            1582#
FLGT1 = 000100            1578#
FLGT2 = 000040            1579#
FMT10   012560            3816#
FMT10A  012634            3816#
FMT11   012655            3816#  4245    4262
FMT12   012674            3816#
FMT13   012703            3816#
FMT14   012751            3816#
FMT15   012766            3816#  3911
FMT15A  013020            3816#
FMT16   013072            3816#
FMT16A  013115            3816#
FMT17   013157            3816#
FMT17A  013236            3816#
FMT17B  013317            3816#
FMT17C  013372            3816#
FMT19   013452            3345   3816#
FMT2    012126            3816#
FMT21   013503            3816#  3944    3989    4034    4069    4104
FMT22   013513            3816#  3950    3995    4040    4110
FMT23   013535            3816#  3970    4015    4086
FMT24   013614            3816#  4284    4361
FMT25   013627            3816#  4294    4328    4371
FMT26   013657            3816#  4311    4345    4388
FMT27   013712            3816#  3960    4005    4050    4120
FMT28   013721            3816#
FMT29   013755            3816#  4301    4318    4335    4378
FMT3    012163            3816#  3921
FMT30   013762            3305   3816#
FMT31   014017            3316   3816#
FMT32   014065            3327   3816#
FMT39   014117            3816#
FMT4    012247            3816#  4159    4235
FMT4A   012305            3816#  4169    4203
FMT4B   012340            3816#  4176    4193    4210    4252
FMT4C   012345            3816#  4186    4220
FMT40   014150            3816#  4076
FMT5    012400            3816#  3874
FMT5A   012443            3816#  3890
FMT7    012530            3816#
FRSTIM  002370            1721#  4424    4433*
F$AU  = 000015             959#  4614    4616
F$AUTO= 000020             959#  4534    4570
F$BGN = 000040             959#   962    3851    3866    3905    3940    3985    4030    4065    4100    4404    4417    4534
                          4504   4598    4614    4634    4645    4655    4677    4689    4702    4712    4725    4736    4747
                          4750   4771    4778    4815    4842    4856    4880    4900    4913    4926    4940    4953    4966
                          4979   4992    5005    5021    5034    5050    5063    5079    5092    5108    5121    5137    5150
                          5163   5179    5192    5208    5221    5235    5248    5820    5839    5849    5859    5873    5883
                          5893   5903    5913    5922    5933    5949    5960    5977    5991    6002    6013    6024    6035
                          6052   6055    6081    6100    6110    6120    6134    6144    6154    6163    6174    6190    6201
                          6214   6225    6235    6246    6257    6268    6277    6280    6306    6324    6334    6344    6358
                          6368   6378    6387    6398    6414    6425    6438    6449    6459    6470    6481    6492    6501
                          6504   6526    6543    6565    6575    6585    6595    6605    6618    6629    6644    6655    6666
                          6677   6689    6711    6728    6750    6760    6770    6780    6790    6802    6813    6827    6838
                          6849   6860    6872    6900    6906    6910    6941    6960    6980    6989    7033    7052    7064
```

```
                    7083    7095    7114    7134    7138    7167    7184    7203    7213    7223    7233    7243    7252
                    7263    7273    7284    7298    7309    7323    7334    7344    7355    7365    7376    7386    7397
                    7414    7425    7442    7456    7467    7478    7489    7500    7503    7519    7570    7588
F$CLEA= 000007       9590    4584    4588
F$DU  = 000016       9590    4598    4603
F$END = 000041       9590     962    3862    3901    3935    3979    4024    4059    4094    4129    4517    4572    4590
                    4605    4618    4634    4645    4655    4677    4689    4702    4712    4725    4736    4747    4750
                    4752    4771    4778    4815    4842    4856    4880    4900    4913    4926    4940    4953    4966
                    4979    4992    5005    5021    5034    5050    5063    5079    5092    5108    5121    5137    5150
                    5163    5179    5192    5208    3221    5235    5248    5250    5820    5839    5849    5859    5873
                    5883    5893    5903    5913    5922    5933    5949    5960    5977    5991    6002    6013    6024
                    6035    6052    6055    6057    6081    6100    6110    6120    6134    6144    6154    6163    6174
                    6190    6201    6214    6225    6235    6246    6257    6268    6277    6280    6282    6306    6324
                    6334    6344    6358    6368    6378    6387    6398    6414    6425    6438    6449    6459    6470
                    6481    6492    6501    6504    6506    6526    6543    6565    6575    6585    6595    6605    6618
                    6629    6644    6655    6666    6677    6689    6691    6711    6728    6750    6760    6770    6780
                    6790    6802    6813    6827    6838    6849    6860    6872    6874    6900    6906    6910    6941
                    6960    6980    6982    6989    7033    7052    7064    7083    7095    7114    7134    7136    7138
                    7140    7167    7184    7203    7213    7223    7233    7243    7252    7263    7273    7284    7298
                    7309    7323    7334    7344    7355    7365    7376    7386    7397    7414    7425    7442    7456
                    7467    7478    7489    7500    7503    7505    7554    7576    7588
F$HARD= 000004       9590    7519    7552
F$HW  = 000013       9590    1105    1121
F$INIT= 000006       9590    4417    4515
F$JMP = 000050       9590    4778    6906
F$MOD = 000000       9590     962    7588
F$MSG = 000011       9590    3851    3860    3866    3899    3905    3933    3940    3977    3985    4022    4030    4057
                    4065    4092    4100    4127
F$PROT= 000021       9590    4404    4409
F$PWR = 000017       9590
F$RPT = 000012       9590
F$SEG = 000003       9590
F$SOFT= 000005       9590    7570    7574
F$SRV = 000010       9590
F$SUB = 000002       9590    6911    6980    6990    7134
F$SW  = 000014       9590    1130    1135
F$TEST= 000001       9590    4635    4750    4772    5248    5821    6055    6082    6280    6307    6504    6527    6689
                    6712    6872    6901    7138    7168    7503
GDATA   002324      1702#   2104*   2148*   2195*   2266*   2362    2634*   2635*   2738*   3505*   3506*   3523*   3524*
                    3867*   3869    3889    3920    3969    4014    4085    4145    4803*   4804*   4871*   4887*   5012*
                    5041*   5070*   5099*   5128*   5170*   5199*   6931*   7016*   7022*
GETBSR  004024      2298#
GETPRM  022740      4462    4476#   4485
GETURS  004360      2394#   4357
GETVRS  004460      2425#   4280
GETWSR  004166      2103    2147    2194    2265    2319#   4870    5237
GOODAT  002364      1719#
G$CNTO= 000200       9590
G$DELM= 000372       9590
G$DISP= 000003       9590
G$EXCP= 000400       9590
G$HILI= 000002       9590
G$LOLI= 000001       9590
G$NO  = 000000       9590
G$OFFS= 000400       9590    7523    7528    7533    7539    7545
G$OFSI= 000376       9590    7523    7528    7533    7539    7545
```

CROSS REFERENCE TABLE -- USER SYMBOLS

```
G$PRMA= 000001            9590#  7523   7528
G$PRMD= 000002            9590#  7533   7539   7545
G$PRML= 000000            9590#
G$RADA= 000140            9590#
G$RADB= 000000            9590#
G$RADD= 000040            9590#
G$RADL= 000120            9590#
G$RADO= 000020            9590#  7523   7528   7533   7539   7545
G$XFER= 000004            9590#
G$YES = 000010            9590#  7523   7528   7533   7539   7545
HDX   = 000004           13880#
HELP  = 000000            950#   984   1072   1096   2073
HOE   = 100000 G          1212#
IBE   = 010000 G          1209#
IDLE  = 000010            1329#
IDLES = 004000            1338#  4831   5833   7178
IDU   = 000040 G          1202#
IEI   = 000001            1219#
IEO   = 000020            1218#
IER   = 020000 G          1210#
INIDMV  005376           27160#  4636   4773   5822   6082   6307   6528   6713   7169
INITRN  007234           31520#  4638   5832   6093   6317   6536   6721   7177
INITT1  004534           24630#
INITT2  004734           25500#
INTFLG  002346           17110#
INTGRL= 000001           16370#  3260   4775
INTSC = 000200           15940#
ISR   = 000100 G          1203#
IXE   = 004000 G          1208#
I$AU  = 000041             959#  4614#  4618#
I$AUTO= 000041             959#  4534#  4572#
I$CLN = 000041             959#  4584#  4590#
I$DU  = 000041             959#  4598#  4605#
I$HRD = 000041            7519#  7554#
I$INIT= 000041             959#  4417#  4517#
I$MOD = 000041             959#   962#  7588#
I$MSG = 000041             959#  3851#  3862#  3866#  3901#  3905#  3935#  3940#  3979#  3985#  4024#  4030#  4059#
                          4065#  4094#  4100#  4129#
I$PROT= 000040             959#  4404#
I$PTAB= 000041             959#
I$PWR = 000041             959#
I$RPT = 000041             959#
I$SEG = 000041             959#  4634   4771   5820   6081   6306   6526   6711   6900   6910   6989   7167
I$SETU= 000041             959#
I$SFT = 000041            7570#  7576#
I$SRV = 000041             959#
I$SUB = 000041             959#  4634   4771   5820   6081   6306   6526   6711   6900   6910#  6941   6960   6980#
                          6982#  6989#  7033   7052   7064   7083   7095   7114   7134#  7136#  7167
I$TST = 000041             959#  4634#  4645   4655   4677   4689   4702   4712   4725   4736   4747   4750#  4752#
                          4771#  4778   4815   4842   4856   4880   4900   4913   4926   4940   4953   4966   4979
                          4992   5005   5021   5034   5050   5063   5079   5092   5108   5121   5137   5150   5163
                          5179   5192   5208   5221   5235   5248#  5250#  5820#  5839   5849   5859   5873   5883
                          5893   5903   5913   5922   5933   5949   5960   5977   5991   6002   6013   6024   6035
                          6052   6055#  6057#  6081#  6100   6110   6120   6134   6144   6154   6163   6174   6190
                          6201   6214   6225   6235   6246   6257   6268   6277   6280#  6282#  6306#  6324   6334
                          6344   6358   6368   6378   6387   6398   6414   6425   6438   6449   6459   6470   6481
```

```
                    6492    6501    6504#   6506#   6526#   6543    6565    6575    6585    6595    6605    6618    6629
                    6644    6655    6666    6677    6689#   6691#   6711#   6728    6750    6760    6770    6780    6790
                    6802    6813    6827    6838    6849    6860    6872#   6874#   6900#   6906    6910    6989    7138#
                    7140#   7167#   7184    7203    7213    7223    7233    7243    7252    7263    7273    7284    7298
                    7309    7323    7334    7344    7355    7365    7376    7386    7397    7414    7425    7442    7456
                    7467    7478    7489    7500    7503#   7505#
J$JMP = 000167        959#
LOADAT  002362       1718#
LOE   = 040000 G     1211#
LOGDEV  002334       1706#   4470*   4477*   4479    4564
LOT   = 000010 G     1200#
LUSWI1  002464       1763#   4502*
LUSWI2  002466       1764#   4503*
LU1MOD  002000 G      962#
L$ACP   002110 G     1061#
L$APT   002036 G     1019#
L$AU    023230 G     1046    4614#
L$AUT   002070 G     1045#
L$AUTO  023076 G     1062    4534#
L$CCP   002106 G     1059#
L$CLEA  023222 G     1060    4584#
L$CO    002032 G     1015#
L$DEPO  002011 G      997#
L$DESC  003304 G     1052    2061#
L$DESP  002076 G     1051#
L$DEVP  002060 G     1037#
L$DISP  002124 G     1022    1085#
L$DLY   002116 G     1067#
L$DTP   002040 G     1021#
L$DTYP  002034 G     1017#
L$DU    023224 G     1048    4598#
L$DUT   002072 G     1047#
L$DVTY  003264 G     1038    2049#
L$EF    002052 G     1032#
L$ENVI  002044 G     1025#
L$ERRT  002172 G     1056    1660#
L$ETP   002102 G     1055#
L$EXP1  002046 G     1027#
L$EXP4  002064 G     1041#
L$EXP5  002066 G     1043#
L$HARD  033652 G     1004    7519    7520#
L$HIME  002120 G     1069#
L$HPCP  002016 G     1003#
L$HPTP  002022 G     1007#
L$HW    002150 G     1008    1105    1106#
L$ICP   002104 G     1057#
L$INIT  022554 G     1058    4417#
L$LADP  002026 G     1011#
L$LAST  034514 G     1012    7594#
L$LOAD  002100 G     1053#
L$LUN   002074 G     1049#
L$MREV  002050 G     1029#
L$NAME  002000 G      986#
L$PRIO  002042 G     1023#
L$PROT  022546 G     1064    4404#
L$PRT   002112 G     1063#
```

```
L$REPP  002062 G          10390
L$REV   002010 G           9950
L$SOFT  034302 G          7570   7571#
L$SPC   002056 G          10350
L$SPCP  002020 G          10050
L$SPTP  002024 G          10090
L$STA   002030 G          10130
L$SW    002172 G          1130   1131#
L$TEST  002114 G          10650
L$TIML  002014 G          10010
L$UNIT  002012 G           9990
L10000  002170            1105   1121#
L10001  002172            1130   1135#
L10002  020116            38600
L10003  020242            38990
L10004  020362            39330
L10005  020536            39770
L10006  020712            40220
L10007  021026            40570
L10010  021144            40920
L10011  021260            41270
L10013  023074            45150
L10014  023212            45700
L10015  023222            45880
L10016  023226            46030
L10017  023230            46160
L10020  023530            4646   4656   4678   4690   4703   4713   4726   4737   4748   47500
L10021  025406            4779   4816   4843   4857   4881   4901   4914   4927   4941   4954   4967   4980   4993
                          5006   5022   5035   5051   5064   5080   5093   5109   5122   5138   5151   5164   5180
                          5193   5209   5222   5236   52480
L10022  027112            5840   5850   5860   5874   5884   5894   5904   5914   5923   5934   5950   5961   5978
                          5992   6003   6014   6025   6036   6053   60550
L10023  027654            6101   6111   6121   6135   6145   6155   6164   6175   6191   6202   6215   6226   6236
                          6247   6258   6269   6278   62800
L10024  030416            6325   6335   6345   6359   6369   6379   6388   6399   6415   6426   6439   6450   6460
                          6471   6482   6493   6502   65040
L10025  031100            6544   6566   6576   6586   6596   6606   6619   6630   6645   6656   6667   6678   66890
L10026  031562            6729   6751   6761   6771   6781   6791   6803   6814   6828   6839   6850   6861   68720
L10027  032526            6907   71380
L10030  032034            6942   6961   69800
L10031  032524            7034   7053   7065   7084   7096   7115   71340
L10032  033646            7185   7204   7214   7224   7234   7244   7253   7264   7274   7285   7299   7310   7324
                          7335   7345   7356   7366   7377   7387   7398   7415   7426   7443   7457   7468   7479
                          7490   7501   75030
L10033  033730            7519   75530
L10034  034302            7570   75750
MCLR  = 000100            12300  1232   2094   2104
MCODE   025410            4782   4794   52500
MDMRDY= 000040            14010  6929   6931   7014   7016   7020   7022   7104   7123
MLWRI   003722            2231   22560
MPCSR   002416            17360  3942   3987   4032   4067   4102   4490
MPIVEC  002456            17600  4498*
MPOVEC  002460            17610  4499*  4500*
MPRIOR  002462            17620  4501*
MRDY  = 000200            12370  2101   2144   2191   2263   4868
MREQ  = 000001            12310  1232   2094   2104
```

```
MSTCLR  003352          20940  2716   6913   6992
NCRACT= 020000          16460  6661   6672   6844   6855
NCTBMT= 000200          16420  3389
NEWLIN  012123          38160
NEWST   022720          4454   44690
NFCRDA= 040000          16450  6672   6855
NOCHK = 003400          13410  4639
NOCRDA= 100000          16440  4720   4731   4742
NOLOOP= 001000          16400  5823   5829   6083   6089   6308   6314   6529   6534   6714   6719   7170   7175
NORXEN= 040000          16390
NULCLK= 000200          13830
OVRC  = 002000          13430  6094
O$APTS= 000000           9590  1013
O$AU  = 000001           9590   9830  1045
O$BGNR= 000000           9590  1039
O$BGNS= 000000           9590  1005
O$DU  = 000001           9590   9830  1047
O$ERRT= 000001           9590   9830  1055
O$GNSW= 000000           9590  1009
O$POIN= 000001           9590   9830  1071
O$SETU= 000000           9590   999   7592
PALENB= 000001          15480
PATCH   034302          75780
PATE    002576          18160
PATF    002606          18270  2624
PATG    002616          18380
PATI    002741          19290
PATJ    003002          19650
PATK    003012          19760  7403   7428
PATL    003033          19960
PATN    003054          20160
PATX    002645          18640  5938   5963   6179   6403
PBLENB= 000002          15470
PCR   = 120407          13490  3172
PCSAEH= 120405          13210  3166   4834
PCSARL= 120404          13140  3162   4829
PNT   = 001000 G        12060
PRESET= 000001          13900  2618   3156   4824
PRI   = 002000 G        12070
PRIOR   002342          17090
PRIRTY  034007           7534  75550
PRI00 = 000000 G        11950
PRI01 = 000040 G        11940
PRI02 = 000100 G        11930
PRI03 = 000140 G        11920
PRI04 = 000200 G        11910
PRI05 = 000240 G        11900
PRI06 = 000300 G        11890
PRI07 = 000340 G        11880
PROTO = 000100          13260
PSTACK  002340          17080  4419*
RABGA = 000004          12710  3577   3579   3589
RAMADR= 001000          16340  4783   4795   4861
RCVBUF  003064          20320
RCVDAT= 000002          14050  6928   7013   7019
RCV1ST  011624          36990  5916   6157   6381   6612   6796   7246
```

CROSS REFERENCE TABLE -- USER SYMBOLS

```
RDA    = 000200          1365#  2907   2918   3720
RDSRH  = 120401          1265#  2991   3038   3477
RDSRL  = 120400          1259#  3480
READ     003454          2136#  2357   2398   2403   2428
READI    003566          2182#  2485   2572   2626   2731   2767   2812   2857   2902   2947   2990   3037   3104
                         3206   3476   3479   3490   3717   4705   4797   6925   6947   6966   7006   7039   7070
                         7101   7120
REDBYT   002356          1716#
REDDAT   002516          1781#
REDLOC=  000001          1242#  2137   2148   2184   2195
REDPAG=  000003          1244#
REGNUM   002336          1707#  2632*  2633*  2737*  2766*  2811*  2856*  2901*  2946*  2989*  3036*  3103*  3495*
                         3504*  3522*  3527*  3906   3955   4000   4045   4075   4115   4802*  4886*  4932*  5011*
                         5040*  5069*  5098*  5127*  5169*  5198*  5227*  6923*  7002*
REG0     002526          1784#  5821*  6038*  6527*  6680*  6712*  6863*  7168*
REG1     002530          1785#
REG2     002532          1786#
REG3     002534          1787#
REG4     002536          1788#
REG5     002540          1789#
REG6     002542          1790#
REG7     002544          1791#
REOM   = 000002          1272#  3066   3077   3600   3602   3612
RERCHK=  000001          1282#  3528   6007   6168   6195   6219   6240   6251   6262   6392   6419   6443   6464
                         6475   6486   6671   6854   7349   7472
RERR   = 000200          1268#  3531   3533   3543
RETADR   002354          1715#
RING   = 000200          1399#  6929   6931   7013   7020   7022
ROR    = 000010          1270#  2995   3006   3554   3556   3566
RSA    = 000020          1368#  2952   2963
RSOM   = 000001          1273#  3042   3053   3623   3625   3635
RSTCHK   005104          2612#
RTSND  = 000010          1387#  2618   2621   2694   3156   3159   4697   4824   4827   6946   7038
RUN    = 000200          1229#  1232   2094   2104
RXABGA=  002000          1278#
RXACT  = 000040          1367#  2817   2828
RXCHAR   010350          3473#  4717   4728   4739   5925   5952   5969   5983   5994   6005   6016   6027   6166
                         6193   6217   6238   6249   6260   6390   6417   6441   6462   6473   6484   6621   6636
                         6647   6658   6669   6805   6819   6830   6841   6852   7255   7276   7290   7301   7326
                         7347   7368   7389   7417   7434   7448   7459   7470   7481   7492
RXDL   = 000007          1356#  3484   6095   6319
RXEN   = 000100          1384#  3192   3222   4684   4697
RXEOM  = 001000          1279#  6670   6853
RXERR  = 100000          1276#  6006   7348   7471
RXOR   = 004000          1277#
RXSOM  = 000400          1280#  6622   6806
SAVE4    002372          1722#  4426*  4430
SAVE6    002374          1723#  4427*  4431
SAVLEN   002402          1726#  3169*  3170*  3484   4423*
SCRACH   002332          1705#
SECAD  = 000020          1328#
SECADR=  010000          1337#
SEL0     002416          1735#  2319
SEL10    002436          1748#  2323
SEL12    002442          1751#  2324
SEL14    002446          1754#  2325
```

CROSS REFERENCE TABLE -- USER SYMBOLS

```
SEL16   002452            1757#  2326
SEL2    002422            1739#  2320
SEL4    002426            1742#  2136*  2183*  2229*  2254*  2321   4860*  4861*
SEL6    002432            1745#  2206   2230*  2255*  2322
SETVIA  005304            2682#  2717
SFPTBL  002172 G          1132#
SFR   = 000001            1372#
SPEED = 000020            1402#  6928   7013   7019
SRMODE= 000034            1536#
STALL   004356            2381#
STARES  002412            1730#  3302   3313   3324   3341   4465*  4471*
STARST  022710            4440   4447   4464#
STEPLU  012072            3204   3395   3443   3664   3714   3770   3793#  4692
STRIP = 000040            1327#
STRIPS= 020000            1336#  4639   4831   5833   6094   6318   7178
STRTML= 000301            1232#
STUREG  004250            2348#
SUBRPC  002344            1710#  4420*
SVCGBL= 000000             959#   962    969#   986    995    997    999    1001   1003   1005   1007   1009   1011
                          1013   1015   1017   1019   1021   1023   1025   1027   1029   1032   1035   1037   1039
                          1041   1043   1045   1047   1049   1051   1053   1055   1057   1059   1061   1063   1065
                          1067   1069   1085   1106   1107   1131   1132   1660   2049   2061   3851   3866   3905
                          3940   3985   4030   4065   4100   4404   4417   4534   4584   4598   4614   7520   7571
                          7594#  7595
SVCINS= 000001             959#   966#   987    988    989    990    991    992    993    994    996    998    1000
                          1002   1004   1006   1008   1010   1012   1014   1016   1018   1020   1022   1024   1026
                          1028   1030   1031   1033   1034   1036   1038   1040   1042   1044   1046   1048   1050
                          1052   1054   1056   1058   1060   1062   1064   1066   1068   1070   1084   1086   1087
                          1088   1089   1090   1091   1092   1093   1094   1105   1130   2050   2053   2062   2069
                          2107   2108   2109   2110   2151   2152   2153   2154   2198   2199   2200   2201   2269
                          2270   2271   2272   2368   2369   2370   2371   2640   2641   2642   2643   2744   2745
                          2746   2747   2777   2778   2779   2780   2788   2789   2790   2791   2822   2823   2824
                          2825   2833   2834   2835   2836   2867   2868   2869   2870   2878   2879   2880   2881
                          2912   2913   2914   2915   2923   2924   2925   2926   2957   2958   2959   2960   2968
                          2969   2970   2971   3000   3001   3002   3003   3011   3012   3013   3014   3047   3048
                          3049   3058   3058   3059   3060   3061   3071   3072   3073   3074   3082   3083   3084
                          3085   3114   3115   3116   3117   3126   3127   3128   3129   3305   3306   3307   3308
                          3309   3316   3317   3318   3319   3320   3327   3328   3329   3330   3331   3344   3345
                          3346   3347   3348   3349   3499   3500   3501   3502   3512   3513   3514   3515   3538
                          3539   3540   3541   3548   3549   3550   3551   3561   3562   3563   3564   3571   3572
                          3573   3574   3584   3585   3586   3587   3594   3595   3596   3597   3607   3608   3609
                          3610   3617   3618   3619   3620   3630   3631   3632   3633   3640   3641   3642   3643
                          3854   3855   3856   3857   3858   3861   3873   3874   3875   3876   3877   3878   3888
                          3889   3890   3891   3892   3893   3894   3900   3909   3910   3911   3912   3913   3914
                          3915   3918   3919   3920   3921   3922   3923   3924   3925   3927   3928   3929   3930
                          3931   3934   3942   3943   3944   3945   3946   3947   3948   3950   3951   3952   3953
                          3954   3958   3959   3960   3961   3962   3963   3964   3967   3968   3969   3970   3971
                          3972   3973   3974   3978   3987   3988   3989   3990   3991   3992   3993   3995   3996
                          3997   3998   3999   4003   4004   4005   4006   4007   4008   4009   4012   4013   4014
                          4015   4016   4017   4018   4019   4023   4032   4033   4034   4035   4036   4037   4038
                          4040   4041   4042   4043   4044   4048   4049   4050   4051   4052   4053   4054   4058
                          4067   4068   4069   4070   4071   4072   4073   4075   4076   4077   4078   4079   4080
                          4083   4084   4085   4086   4087   4088   4089   4090   4093   4102   4103   4104   4105
                          4106   4107   4108   4110   4111   4112   4113   4114   4118   4119   4120   4121   4122
                          4123   4124   4128   4157   4158   4159   4160   4161   4162   4163   4165   4166   4167
                          4168   4169   4170   4171   4172   4173   4175   4176   4177   4178   4179   4180   4182
```

F15

CROSS REFERENCE TABLE -- USER SYMBOLS

4183	4184	4185	4186	4187	4188	4189	4190	4192	4193	4194	4195	4196
4197	4199	4200	4201	4202	4203	4204	4205	4206	4207	4209	4210	4211
4212	4213	4214	4216	4217	4218	4219	4220	4221	4222	4223	4224	4233
4234	4235	4236	4237	4238	4239	4241	4242	4243	4244	4245	4246	4247
4248	4249	4251	4252	4253	4254	4255	4256	4258	4259	4260	4261	4262
4263	4264	4265	4266	4268	4269	4270	4271	4272	4282	4283	4284	4285
4286	4287	4288	4290	4291	4292	4293	4294	4295	4296	4297	4298	4300
4301	4302	4303	4304	4305	4307	4308	4309	4310	4311	4312	4313	4314
4315	4317	4318	4319	4320	4321	4322	4324	4325	4326	4327	4328	4329
4330	4331	4332	4334	4335	4336	4337	4338	4339	4341	4342	4343	4344
4345	4346	4347	4348	4349	4359	4360	4361	4362	4363	4364	4365	4367
4368	4369	4370	4371	4372	4373	4374	4375	4377	4378	4379	4380	4381
4382	4384	4385	4386	4387	4388	4389	4390	4391	4392	4437	4438	4440
4444	4445	4447	4451	4452	4454	4458	4459	4461	4479	4480	4481	4483
4509	4516	4537	4538	4539	4540	4541	4542	4559	4560	4564	4565	4571
4589	4601	4604	4617	4643	4645	4646	4653	4655	4656	4675	4677	4678
4687	4689	4690	4700	4702	4703	4710	4712	4713	4723	4725	4726	4734
4736	4737	4745	4747	4748	4751	4778	4779	4810	4811	4812	4813	4815
4816	4840	4842	4843	4854	4856	4857	4875	4876	4877	4878	4880	4881
4895	4896	4897	4898	4900	4901	4908	4909	4910	4911	4913	4914	4921
4922	4923	4924	4926	4927	4935	4936	4937	4938	4940	4941	4948	4949
4950	4951	4953	4954	4961	4962	4963	4964	4966	4967	4974	4975	4976
4977	4979	4980	4987	4988	4989	4990	4992	4993	5000	5001	5002	5003
5005	5006	5016	5017	5018	5019	5021	5022	5029	5030	5031	5032	5034
5035	5045	5046	5047	5048	5050	5051	5058	5059	5060	5061	5063	5064
5074	5075	5076	5077	5079	5080	5087	5088	5089	5090	5092	5093	5103
5104	5105	5106	5108	5109	5116	5117	5118	5119	5121	5122	5132	5133
5134	5135	5137	5138	5145	5146	5147	5148	5150	5151	5158	5159	5160
5161	5163	5164	5174	5175	5176	5177	5179	5180	5187	5188	5189	5190
5192	5193	5203	5204	5205	5206	5208	5209	5216	5217	5218	5219	5221
5222	5230	5231	5232	5233	5235	5236	5241	5242	5243	5244	5249	5837
5839	5840	5847	5849	5850	5857	5859	5860	5871	5873	5874	5881	5883
5884	5891	5893	5894	5901	5903	5904	5911	5913	5914	5920	5922	5923
5931	5933	5934	5947	5949	5950	5958	5960	5961	5975	5977	5978	5989
5991	5992	6000	6002	6003	6011	6013	6014	6022	6024	6025	6033	6035
6036	6050	6052	6053	6056	6098	6100	6101	6108	6110	6111	6118	6120
6121	6132	6134	6135	6142	6144	6145	6152	6154	6155	6161	6163	6164
6172	6174	6175	6188	6190	6191	6199	6201	6202	6212	6214	6215	6223
6225	6226	6233	6235	6236	6244	6246	6247	6255	6257	6258	6266	6268
6269	6275	6277	6278	6281	6322	6324	6325	6332	6334	6335	6342	6344
6345	6356	6358	6359	6366	6368	6369	6376	6378	6379	6385	6387	6388
6396	6398	6399	6412	6414	6415	6423	6425	6426	6436	6438	6439	6447
6449	6450	6457	6459	6460	6468	6470	6471	6479	6481	6482	6490	6492
6493	6499	6501	6502	6505	6541	6543	6544	6563	6565	6566	6573	6575
6576	6583	6585	6586	6593	6595	6596	6603	6605	6606	6616	6618	6619
6627	6629	6630	6642	6644	6645	6653	6655	6656	6664	6666	6667	6675
6677	6678	6690	6726	6728	6729	6748	6750	6751	6758	6760	6761	6768
6770	6771	6778	6780	6781	6788	6790	6791	6800	6802	6803	6811	6813
6814	6825	6827	6828	6836	6838	6839	6847	6849	6850	6858	6860	6861
6873	6906	6907	6911	6936	6937	6938	6939	6941	6942	6955	6956	6957
6958	6960	6961	6974	6975	6976	6977	6981	6990	7028	7029	7030	7031
7033	7034	7047	7048	7049	7050	7052	7053	7059	7060	7061	7062	7064
7065	7078	7079	7080	7081	7083	7084	7090	7091	7092	7093	7095	7096
7109	7110	7111	7112	7114	7115	7128	7129	7130	7131	7135	7139	7182
7184	7185	7201	7203	7204	7211	7213	7214	7221	7223	7224	7231	7233
7234	7241	7243	7244	7250	7252	7253	7261	7263	7264	7271	7273	7274

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                    7282  7284  7285  7296  7298  7299  7307  7309  7310  7321  7323  7324  7332
                    7334  7335  7342  7344  7345  7353  7355  7356  7363  7365  7366  7374  7376
                    7377  7384  7386  7387  7395  7397  7398  7412  7414  7415  7423  7425  7426
                    7440  7442  7443  7454  7456  7457  7465  7467  7468  7476  7478  7479  7487
                    7489  7490  7498  7500  7501  7504  7519  7523  7524  7525  7526  7528  7529
                    7530  7531  7533  7534  7535  7536  7537  7539  7540  7541  7542  7543  7545
                    7546  7547  7548  7549  7552  7570  7574  7591  7592  7593
SVCSUB= 000001        9590   9680  6910  6989
SVCTAG= 000001        9590   9700  1077  1081  1121  1135  3860  3899  3933  3977  4022  4057  4092
                    4127  4515  4570  4588  4603  4616  4750  5248  6055  6280  6504  6689  6872
                    6980  7134  7138  7503  7553  7575
SVCTST= 000001        9590   9670  4634  4771  5820  6081  6306  6526  6711  6900  7167
SWPBOT= 121000       16280
SWPDDC= 121400       16290
SYNCH = 000226       13150  3199  4639  5833  5843  5853  6094  6104  6114  6250  6261  6318  6328
                    6338  6474  6485  7178
S$LSYM= 010000        9590  11220  11360  38610  39000  39340  39780  40230  40580  40930  41280  45160  45710
                    45890  46040  46170  47510  52490  60560  62810  65050  66900  68730  69810  71350  71390
                    75040  75540  75760
TAB   = 000004       12990
TBMT  = 000100       13660  2862  2873  3209
TCCHEK= 100000       16330  3247  6903
TCON.M  034123        7546  75550
TDATA   002322       17010  2353
TDSRH = 120403       12940  3195  3430  4845
TDSRL = 120402       12880  3198  3377  4848
TDSRNR  002575       18130
TEOM  = 000002       13000  5967  5981  6609  6633  6794  6817  7288  7432  7446
TERR  = 000200       12970
TGA   = 000010       12980
TIMFLG  002352       17140
TM    = 000004       14040  6929  6931
TMP0    002546       17940  4543*  4561  4573*
TMP1    002550       17950
TMP2    002552       17960
TMP3    002554       17970
TMP4    002556       17980
TMP5    002560       17990
TMP6    002562       18000
TMP7    002564       18010
TSO   = 000010       13690  3109  3121
TSOM  = 000001       13010  3196  4659  4663  4846  6042  6208  6229  6432  6453  6547  6550  6553
                    6684  6732  6735  6738  6867  7188  7191
TSTCON  002472       17660  3249  3254  3270  3272  3281  3284  3290  4505*  5827  6087  6312  6532
                    6717  6986  7173
TSTNUM  002414       17310  3344  4772*  6901*
TTLOOP= 000002       13890  3192  3222  3756  3769  4684  4697  6922  6946  6965
TXAB  = 002000       13060
TXACT = 000004       13700  2772  2783
TXCHAR  010136       33720  4670  5842  5852  5866  5876  5886  5896  5906  5942  6103  6113  6127
                    6137  6147  6183  6327  6337  6351  6361  6371  6407  6558  6568  6578  6588
                    6598  6743  6753  6763  6773  6783  7196  7206  7216  7226  7236  7266  7316
                    7337  7358  7379  7407
TXCTRL  010250       34250  4658  4662  4666  5862  5966  5980  6041  6123  6207  6228  6347  6431
                    6452  6546  6549  6552  6555  6608  6632  6683  6731  6734  6737  6740  6793
                    6816  6866  7187  7190  7193  7287  7312  7431  7445
```

```
TXDL  = 000340          13530  3484  6095  6319
TXEN  = 000040          13850  3192  3222  4684  4697
TXEOM = 001000          13070
TXERR = 100000          13040
TXGA  = 004000          13050
TXSOM = 000400          13080
TXTMLT  017744          38250  3888
TXTML0  017154          38160  3825
TXTML1  017160          38160  3825
TXTML2  017174          38160  3825
TXTML3  017211          38160  3825
TXTML4  017233          38160  3825
TXTML5  017254          38160  3825
TXTML6  017304          38160  3825
TXTML7  017316          38160  3825
TXTNP   017500          38160  3837
TXTNPT  020030          38380
TXTNP0  017505          38160  3838
TXTNP1  017515          38160  3838
TXTNP2  017525          38160  3838
TXTNP3  017535          38160  3838
TXTNP4  017552          38160  3838
TXTNP5  017567          38160  3838
TXTNP6  017604          38160  3838
TXTNP7  017620          38160  3838
TXTNP8  017634          38160  3838
TXTNUL  017152          38160
TXTUR   017650          38160  3910  3959  4049
TXTURT  020052          38410  3909  3958  4048
TXTUR0  017663          38160  3841
TXTUR1  017671          38160  3841
TXTUR2  017677          38160  3841
TXTUR3  017705          38160  3841
TXTUR4  017713          38160  3841
TXTUR5  017722          38160  3841
TXTUR6  017731          38160  3841
TXTUR7  017735          38160  3841
TXTVR   017353          38160  3829  4004  4119
TXTVRA  017451          38160  3833
TXTVRB  017454          38160  3833
TXTVRC  017460          38160  3833
TXTVRD  017464          38160  3833
TXTVRE  017470          38160  3833
TXTVRF  017474          38160  3833
TXTVRT  017766          38300  4003  4118
TXTVR0  017371          38160  3830
TXTVR1  017375          38160  3830
TXTVR2  017401          38160  3830
TXTVR3  017406          38160  3830
TXTVR4  017413          38160  3830
TXTVR5  017420          38160  3830
TXTVR6  017425          38160  3830
TXTVR7  017432          38160  3830
TXTVR8  017437          38160  3833
TXTVR9  017444          38160  3833
TXT1    015602          38160  4157
```

```
TXT10   016402            3816#
TXT11   016422            3816#
TXT11A  016474            3816#
TXT11B  016532            3816#
TXT12   016602            3816#  3943   3988   4033   4068   4103
TXT13   016630            3816#  4360
TXT14   016645            3816#  4359
TXT15   016703            3816#  4377
TXT16   016745            3816#  4283
TXT17   016760            3816#  4282
TXT18   017015            3816#  4300
TXT19   017056            3816#  4317
TXT2    015640            3816#  4175
TXT2A   015702            3816#  4192
TXT2B   015741            3816#  4209
TXT20   017112            3816#  4334
TXT3    016004            3816#  4158
TXT4    016034            3816#  4233
TXT4A   016074            3816#  4251
TXT5    016135            3816#
TXT6    016137            3816#  4234
TXT7    016162            3816#
TXT7A   016252            3816#
TXT8    016342            3816#
TXT9    016362            3816#
TXU   = 000002            1371#  3493
T$ARGC= 000005             987#   988#   989#   990#   991#   992#  3305#  3309  3316#  3320  3327#  3331  3344#
                          3349   3854#  3858   3873#  3878   3888#  3894   3909#  3915   3918#  3925   3927#  3931
                          3942#  3948   3950#  3954   3958#  3964   3967#  3974   3987#  3993   3995#  3999   4003#
                          4009   4012#  4019   4032#  4038   4040#  4044   4048#  4054   4067#  4073   4075#  4080
                          4083#  4090   4102#  4108   4110#  4114   4118#  4124   4157#  4163   4165#  4173   4175#
                          4180   4182#  4190   4192#  4197   4199#  4207   4209#  4214   4216#  4224   4233#  4239
                          4241#  4249   4251#  4256   4258#  4266   4268#  4272   4282#  4288   4290#  4298   4300#
                          4305   4307#  4315   4317#  4322   4324#  4332   4334#  4339   4341#  4349   4359#  4365
                          4367#  4375   4377#  4382   4384#  4392
T$CODE= 006032            7523#  7528#  7533#  7539#  7545#
T$ERRN= 000113             959#  4811#  4876#  4896#  4909#  4922#  4936#  4949#  4962#  4975#  4988#  5001#  5017#
                          5030#  5046#  5059#  5075#  5088#  5104#  5117#  5133#  5146#  5159#  5175#  5188#  5204#
                          5217#  5231#  5242#  6937#  6956#  6975#  7029#  7048#  7060#  7079#  7091#  7110#  7129#
T$EXCP= 000000            7523#  7527   7528#  7532   7533#  7538   7539#  7544   7545#  7550
T$FLAG= 000040            4645#  4655#  4677#  4689#  4702#  4712#  4725#  4736#  4747#  4778#  4815#  4842#  4856#
                          4880#  4900#  4913#  4926#  4940#  4953#  4966#  4979#  4992#  5005#  5021#  5034#  5050#
                          5063#  5079#  5092#  5108#  5121#  5137#  5150#  5163#  5179#  5192#  5208#  5221#  5235#
                          5839#  5849#  5859#  5873#  5883#  5893#  5903#  5913#  5922#  5933#  5949#  5960#  5977#
                          5991#  6002#  6013#  6024#  6035#  6052#  6100#  6110#  6120#  6134#  6144#  6154#  6163#
                          6174#  6190#  6201#  6214#  6225#  6235#  6246#  6257#  6268#  6277#  6324#  6334#  6344#
                          6358#  6368#  6378#  6387#  6398#  6414#  6425#  6438#  6449#  6459#  6470#  6481#  6492#
                          6501#  6543#  6565#  6575#  6585#  6595#  6605#  6618#  6629#  6644#  6655#  6666#  6677#
                          6728#  6750#  6760#  6770#  6780#  6790#  6802#  6813#  6827#  6838#  6849#  6860#  6906#
                          6941#  6960#  7033#  7052#  7064#  7083#  7095#  7114#  7184#  7203#  7213#  7223#  7233#
                          7243#  7252#  7263#  7273#  7284#  7298#  7309#  7323#  7334#  7344#  7355#  7365#  7376#
                          7386#  7397#  7414#  7425#  7442#  7456#  7467#  7478#  7489#  7500#
T$GMAN= 000000             959#
T$MILI= 000004            7523#  7526   7528#  7531   7533#  7537   7539#  7543   7545#  7549
T$LAST= 000001             959#  7592#
T$LOLI= 000000            7523#  7525   7528#  7530   7533#  7536   7539#  7542   7545#  7548
```

```
T$LSYM= 010000          9590  1122  1136  3861  3900  3934  3978  4023  4058  4093  4128  4516  4571
                        4589  4604  4617  4751  5249  6056  6281  6505  6690  6873  6981  7135  7139
                        7504  7554  7576
T$LTNO= 000011          7595#
T$NEST= 177777          9590   962#  1105#  1121#  1130#  1135#  3851#  3860#  3866#  3899#  3905#  3933#  3940#
                        3977#  3985#  4022#  4030#  4057#  4065#  4092#  4100#  4127#  4404#  4409#  4417#  4515#
                        4534#  4570#  4584#  4588#  4598#  4603#  4614#  4616#  4635#  4750#  4772#  5248#  5821#
                        6055#  6082#  6280#  6307#  6504#  6527#  6689#  6712#  6872#  6901#  6911#  6980#  6990#
                        7134#  7138#  7168#  7503#  7519#  7552#  7570#  7574#  7588#
T$NS0 = 000000           962#  7588
T$NS1 = 000005          1105#  1121  1130#  1135  3851#  3860  3866#  3899  3905#  3933  3940#  3977  3985#
                        4022  4030#  4057  4065#  4092  4100#  4127  4404#  4409  4417#  4515  4534#  4570
                        4584#  4588  4598#  4603  4614#  4616  4635#  4750  4772#  5248  5821#  6055  6082#
                        6280  6307#  6504  6527#  6689  6712#  6872  6901#  7138  7168#  7503  7519#  7552
                        7570#  7574
T$NS2 = 000002          6911#  6980  6990#  7134
T$PTNU= 000000          9590#
T$SAVL= 177777          9590#
T$SEGL= 177777          9590#
T$SUBN= 000000          9590#  4634#  4771#  5820#  6081#  6306#  6526#  6711#  6900#  6910#  6989#  7167#
T$TAGL= 177777          9590#
T$TAGN= 010035          9590#  1105#  1130#  3851#  3866#  3905#  3940#  3985#  4030#  4065#  4100#  4404#  4417#
                        4534#  4584#  4598#  4614#  4635#  4772#  5821#  6082#  6307#  6527#  6712#  6901#  6911#
                        6990#  7168#  7519#  7570#
T$TEMP= 000000          1077#  1081#  1086#  1087#  1088#  1089#  1090#  1091#  1092#  1093#  1094#  1095#  1121#
                        1135#  3860#  3899#  3933#  3977#  4022#  4057#  4092#  4127#  4409#  4515#  4570#  4588#
                        4603#  4616#  4645#  4646  4655#  4656  4677#  4678  4689#  4690  4702#  4703  4712#
                        4713  4725#  4726  4736#  4737  4747#  4748  4750#  4778#  4779  4815#  4816  4842#
                        4843  4856#  4857  4880#  4881  4900#  4901  4913#  4914  4926#  4927  4940#  4941
                        4953#  4954  4966#  4967  4979#  4980  4992#  4993  5005#  5006  5021#  5022  5034#
                        5035  5050#  5051  5063#  5064  5079#  5080  5092#  5093  5108#  5109  5121#  5122
                        5137#  5138  5150#  5151  5163#  5164  5179#  5180  5192#  5193  5208#  5209  5221#
                        5222  5235#  3236  5248#  5839#  5840  5849#  5850  5859#  5860  5873#  5874  5883#
                        5884  5893#  5894  5903#  5904  5913#  5914  5922#  5923  5933#  5934  5949#  5950
                        5960#  5961  5977#  5978  5991#  5992  6002#  6003  6013#  6014  6024#  6025  6035#
                        6036  6052#  6053  6055#  6100#  6101  6110#  6111  6120#  6121  6134#  6135  6144#
                        6145  6154#  6155  6163#  6164  6174#  6175  6190#  6191  6201#  6202  6214#  6215
                        6225#  6226  6235#  6236  6246#  6247  6257#  6258  6268#  6269  6277#  6278  6280#
                        6324#  6325  6334#  6335  6344#  6345  6358#  6359  6368#  6369  6378#  6379  6387#
                        6388  6398#  6399  6414#  6415  6425#  6426  6438#  6439  6449#  6450  6459#  6460
                        6470#  6471  6481#  6482  6492#  6493  6501#  6502  6504#  6543#  6544  6565#  6566
                        6575#  6576  6585#  6586  6595#  6596  6605#  6606  6618#  6619  6629#  6630  6644#
                        6645  6655#  6656  6666#  6667  6677#  6678  6689#  6728#  6729  6750#  6751  6760#
                        6761  6770#  6771  6780#  6781  6790#  6791  6802#  6803  6813#  6814  6827#  6828
                        6838#  6839  6849#  6850  6860#  6861  6872#  6906#  6907  6941#  6942  6960#  6961
                        6980#  7033#  7034  7052#  7053  7064#  7065  7083#  7084  7095#  7096  7114#  7115
                        7134#  7138#  7184#  7185  7203#  7204  7213#  7214  7223#  7224  7233#  7234  7243#
                        7244  7252#  7253  7263#  7264  7273#  7274  7284#  7285  7298#  7299  7309#  7310
                        7323#  7324  7334#  7335  7344#  7345  7355#  7356  7365#  7366  7376#  7377  7386#
                        7387  7397#  7398  7414#  7415  7425#  7426  7442#  7443  7456#  7457  7467#  7468
                        7478#  7479  7489#  7490  7500#  7501  7503#  7523#  7528#  7533#  7539#  7545#  7552#
                        7574#  7588#
T$TEST= 000011          9590#  4634#  4771#  5820#  6081#  6306#  6526#  6711#  6900#  6910  6989  7167#  7595
T$TSTM= 177777          9590#  3308  3319  3330  3348  3857  3861  3877  3893  3900  3914  3924  3930
                        3934  3947  3953  3963  3973  3978  3992  3998  4008  4018  4023  4037  4043
                        4053  4058  4072  4079  4089  4093  4107  4113  4123  4128  4162  4172  4179
```

CROSS REFERENCE TABLE -- USER SYMBOLS

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                    4189  4196  4206  4213  4223  4238  4248  4255  4265  4271  4287  4297  4304
                    4314  4321  4331  4338  4348  4364  4374  4381  4391  4438  4445  4452  4459
                    4480  4509  4516  4541  4560  4565  4571  4589  4601  4604  4617  4643  4645
                    4653  4655  4675  4677  4687  4689  4700  4702  4710  4712  4723  4725  4734
                    4736  4745  4747  4751  4778  4810  4815  4840  4842  4854  4856  4875  4880
                    4895  4900  4908  4913  4921  4926  4935  4940  4948  4953  4961  4966  4974
                    4979  4987  4992  5000  5005  5016  5021  5029  5034  5045  5050  5058  5063
                    5074  5079  5087  5092  5103  5108  5116  5121  5132  5137  5145  5150  5158
                    5163  5174  5179  5187  5192  5203  5208  5216  5221  5230  5235  5241  5249
                    5837  5839  5847  5849  5857  5859  5871  5873  5881  5883  5891  5893  5901
                    5903  5911  5913  5920  5922  5931  5933  5947  5949  5958  5960  5975  5977
                    5989  5991  6000  6002  6011  6013  6022  6024  6033  6035  6050  6052  6056
                    6098  6100  6108  6110  6118  6120  6132  6134  6142  6144  6152  6154  6161
                    6163  6172  6174  6188  6190  6199  6201  6212  6214  6223  6225  6233  6235
                    6244  6246  6255  6257  6266  6268  6275  6277  6281  6322  6324  6332  6334
                    6342  6344  6356  6358  6366  6368  6376  6378  6385  6387  6396  6398  6412
                    6414  6423  6425  6436  6438  6447  6449  6457  6459  6468  6470  6479  6481
                    6490  6492  6499  6501  6505  6541  6543  6563  6565  6573  6575  6583  6585
                    6593  6595  6603  6605  6616  6618  6627  6629  6642  6644  6653  6655  6664
                    6666  6675  6677  6690  6726  6728  6748  6750  6758  6760  6768  6770  6778
                    6780  6788  6790  6800  6802  6811  6813  6825  6827  6836  6838  6847  6849
                    6858  6860  6873  6906  6911  6936  6941  6955  6960  6974  6981  6990  7028
                    7033  7047  7052  7059  7064  7078  7083  7090  7095  7109  7114  7128  7135
                    7139  7182  7184  7201  7203  7211  7213  7221  7223  7231  7233  7241  7243
                    7250  7252  7261  7263  7271  7273  7282  7284  7296  7298  7307  7309  7321
                    7323  7332  7334  7342  7344  7353  7355  7363  7365  7374  7376  7384  7386
                    7395  7397  7412  7414  7423  7425  7440  7442  7454  7456  7465  7467  7476
                    7478  7487  7489  7498  7500  7504
T$TSTS= 000001        959#  4635#  4772#  5821#  6082#  6307#  6527#  6712#  6901#  7168#
T$$AU = 010017       4614#  4616
T$$AUT= 010014       4534#  4570
T$$CLE= 010015       4584#  4588
T$$DU = 010016       4598#  4603
T$$HAR= 010033       7519#  7553
T$$HW = 010000       1105#  1121
T$$INI= 010013       4417#  4515
T$$MSG= 010011       3851#  3860  3866#  3899  3905#  3933  3940#  3977  3985#  4022  4030#  4057  4065#
                     4092  4100#  4127
T$$PRO= 010012       4404#
T$$SOF= 010034       7570#  7575
T$$SUB= 010031       6911#  6941  6960  6980  6990#  7033  7052  7064  7083  7095  7114  7134
T$$SW = 010001       1130#  1135
T$$TES= 010032       4635#  4645  4655  4677  4689  4702  4712  4725  4736  4747  4750  4772#  4778
                     4815  4842  4856  4880  4900  4913  4926  4940  4953  4966  4979  4992  5005
                     5021  5034  5050  5063  5079  5092  5108  5121  5137  5150  5163  5179  5192
                     5208  5221  5235  5248  5821#  5839  5849  5859  5873  5883  5893  5903  5913
                     5922  5933  5949  5960  5977  5991  6002  6013  6024  6035  6052  6055  6082#
                     6100  6110  6120  6134  6144  6154  6163  6174  6190  6201  6214  6225  6235
                     6246  6257  6268  6277  6280  6307#  6324  6334  6344  6358  6368  6378  6387
                     6398  6414  6425  6438  6449  6459  6470  6481  6492  6501  6504  6527#  6543
                     6565  6575  6585  6595  6605  6618  6629  6644  6655  6666  6677  6689  6712#
                     6728  6750  6760  6770  6780  6790  6802  6813  6827  6838  6849  6860  6872
                     6901#  6906  7138  7168#  7184  7203  7213  7223  7233  7243  7252  7263  7273
                     7284  7298  7309  7323  7334  7344  7355  7365  7376  7386  7397  7414  7425
                     7442  7456  7467  7478  7489  7500  7503
T.EDF = 000001       1648#  2107  2151  2198  2269  2368  2640  2744  2777  2788  2822  2833  2867
```

```
                        2878    2912    2923    2957    2968    3000    3011    3047    3058    3071    3082    3114    3126
                        3499    3512    3538    3548    3561    3571    3584    3594    3607    3617    3630    3640
T.EMRD= 000002          1648#
T.ESF = 000000          1648#
T.ESFT= 000003          1648#
T1      023232 G        1086    4634#
T1MODE= 000300          1521#
T2      023532 G        1087    4771#
T2MODE= 000040          1531#
T3      026236 G        1088    5820#
T4      027114 G        1089    6081#
T5      027656 G        1090    6306#
T6      030420 G        1091    6526#
T7      031102 G        1092    6711#
T8      031564 G        1093    6900#
T8.1    031606          6910#
T8.2    032060          6989#
T9      032530 G        1094    7167#
UAM   = 000200 G        1204#
UMAINT= 000001          1406#   6928    7013    7019
UNIT    002410          1729#
UPBITS  002566          1804#
UREGS   002242          1694#   2394    2397*   2400    4367    4368    4369    4370    4384    4385    4386    4387
USTATR= 122000          1361#   2399    2732    2768    2813    2858    2903    2948    3105    3207    3491    3718
USYREG  002476          1771#   2625
USYRT = 120400          1253#   2395    2408    2412
VECTOR  033756          7529    7555#
VIA   = 120000          1375#   2426    2433
VIAACR= 120013          1519#   2486    2495    2573    2582    2696    3175    4649
VIADPA= 120003          1425#   2687    6918    6997
VIADPB= 120002          1413#   2684    6915    6994
VIAIER= 120016          1592#   2482    2569    2702
VIAIFR= 120015          1570#
VIAMS = 120001          1397#
VIAORA= 120017          1612#   2690    6926    6948    6967    7007    7040    7071    7102    7121
VIAORB= 120000          1381#   2617    2620    2693    3155    3158    3191    3768    4683    4696    4823    4826    6921
                        6945    6964    7000    7037    7068    7099    7118
VIAPCR= 120014          1557#   2699
VIASR = 120012          1509#   4706
VIAT1A= 120004          1439#   2508
VIAT1B= 120005          1451#   2513    3797
VIAT1C= 120006          1464#   2499    3178
VIAT1D= 120007          1475#   2504    3181
VIAT2A= 120010          1486#   2586
VIAT2B= 120011          1498#   2591
VREGS   002262          1697#   2425    4290    4291    4292    4293    4307    4308    4309    4310    4324    4325    4326
                        4327    4341    4342    4343    4344
WAIT50  005270          2659#
WRIBYT  002360          1717#
WRILOC= 000002          1243#   2256    2266
WRIPAG= 000004          1245#
WRITE   003700          2229#   2351
WRITEI  003712          2253#   2481    2494    2498    2503    2507    2512    2568    2581    2585    2590    2616    2619
                        2683    2686    2689    2692    2695    2698    2701    3154    3157    3161    3165    3171    3174
                        3177    3180    3190    3194    3197    3376    3429    3767    3796    4648    4682    4695    4786
                        4822    4825    4828    4833    4844    4847    6914    6917    6920    6944    6963    6993    6996
```

CROSS REFERENCE TABLE -- USER SYMBOLS

```
                    6999    7036    7067    7098    7117
WSR0     002202     1669#   2319*   4244
WSR10    002212     1677#   2323*   4261
WSR12    002214     1679#   2324*   4260
WSR14    002216     1681#   2325*   4259
WSR16    002220     1683#   2326*   4258
WSR2     002204     1671#   2320*   4243
WSR4     002206     1673#   2321*   4242
WSR6     002210     1675#   2322*   4241
XDATA    002330     1704#   3918    3967    4012    4083    4146*   4147*
XORGB    021262     3916    3965    4010    4081    4144#
XYZ    = 000007     1330#
X$ALWA= 000000       959#
X$FALS= 000040       959#
X$OFFS= 000400       959#
X$TRUE= 000020       959#
$E     = 000113     1648#   2106#   2150#   2197#   2268#   2367#   2639#   2743#   2776#   2787#   2821#   2832#   2866#
                    2877#   2911#   2922#   2956#   2967#   2999#   3010#   3046#   3057#   3070#   3081#   3113#   3125#
                    3498#   3511#   3537#   3547#   3560#   3570#   3583#   3593#   3606#   3616#   3629#   3639#   4809#
                    4874#   4894#   4907#   4920#   4934#   4947#   4960#   4973#   4986#   4999#   5015#   5028#   5044#
                    5057#   5073#   5086#   5102#   5115#   5131#   5144#   5157#   5173#   5186#   5202#   5215#   5229#
                    5240#   6935#   6954#   6973#   7027#   7046#   7058#   7077#   7089#   7108#   7127#
$LSTIN= 000001       964#
$LSTTA= 000001       965#
$T     = 000011     1648#   4618#   4752#   5796#   6057#   6282#   6506#   6691#   6874#   7140#
.      = 034514      955#   1694#   1697#   1781#   2032#   2053#   2069#   3817#   4641    4646    4651    4656    4673
                    4678    4685    4690    4698    4703    4708    4713    4721    4726    4732    4737    4743    4748
                    4779    4816    4838    4843    4852    4857    4881    4901    4914    4927    4941    4954    4967
                    4980    4993    5006    5022    5035    5051    5064    5080    5093    5109    5122    5138    5151
                    5164    5180    5193    5209    5222    5236    5795#   5835    5840    5845    5850    5855    5860
                    5869    5874    5879    5884    5889    5894    5899    5904    5909    5914    5918    5923    5929
                    5934    5945    5950    5956    5961    5973    5978    5987    5992    5998    6003    6009    6014
                    6020    6025    6031    6036    6048    6053    6096    6101    6106    6111    6116    6121    6130
                    6135    6140    6145    6150    6155    6159    6164    6170    6175    6186    6191    6197    6202
                    6210    6215    6221    6226    6231    6236    6242    6247    6253    6258    6264    6269    6273
                    6278    6320    6325    6330    6335    6340    6345    6354    6359    6364    6369    6374    6379
                    6383    6388    6394    6399    6410    6415    6421    6426    6434    6439    6445    6450    6455
                    6460    6466    6471    6477    6482    6488    6493    6497    6502    6539    6544    6561    6566
                    6571    6576    6581    6586    6591    6596    6601    6606    6614    6619    6625    6630    6640
                    6645    6651    6656    6662    6667    6673    6678    6724    6729    6746    6751    6756    6761
                    6766    6771    6776    6781    6786    6791    6798    6803    6809    6814    6823    6828    6834
                    6839    6845    6850    6856    6861    6907    6942    6961    7034    7053    7065    7084    7096
                    7115    7180    7185    7199    7204    7209    7214    7219    7224    7229    7234    7239    7244
                    7248    7253    7259    7264    7269    7274    7280    7285    7294    7299    7305    7310    7319
                    7324    7330    7335    7340    7345    7351    7356    7361    7366    7372    7377    7382    7387
                    7393    7398    7410    7415    7421    7426    7438    7443    7452    7457    7463    7468    7474
                    7479    7485    7490    7496    7501    7579#
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BCOMPL	1#	959#	4439	4446	4453	4460	4482				
BERROR	1#	959#									
BGNAU	1#	959#	4613								
BGNAUT	1#	959#	4533								
BGNCLN	1#	959#	4583								
BGNDU	1#	959#	4597								
BGNHRD	1#	959#	7518								
BGNHW	1#	959#	1104								
BGNINI	1#	959#	4416								
BGNMOD	1#	959#	961								
BGNMSG	1#	959#	3850	3865	3904	3939	3984	4029	4064	4099	
BGNPRO	1#	959#	4403								
BGNPTA	1#	959#									
BGNRPT	1#	959#									
BGNSEG	1#	959#									
BGNSET	1#	959#									
BGNSFT	1#	959#	7569								
BGNSRV	1#	959#									
BGNSUB	1#	959#	6909	6988							
BGNSW	1#	959#	1129								
BGNTST	1#	959#	4634	4771	5820	6081	6306	6526	6711	6900	7167
BNCOMP	1#	959#									
BNERRO	1#	959#									
BREAK	1#	959#									
BRESET	1#	959#	4508	4600							
CKLOOP	1#	959#									
CLOCK	1#	959#									
CLOSE	1#	959#									
CLRVEC	1#	959#	4558								
COMMEN	1#	959#									
DELAY	1#	959#									
DESCRI	1#	959#	2060								
DEVTYP	1#	959#	2048								
DISPAT	1#	959#	1083								
DISPLA	1#	959#									
DOCLN	1#	959#									
DODU	1#	959#	4563								
DORPT	1#	959#									
ENDAU	1#	959#	4615								
ENDAUT	1#	959#	4569								
ENDCLN	1#	959#	4587								
ENDCOM	1#	959#									
ENDDU	1#	959#	4602								
ENDHRD	1#	959#	7551								
ENDHW	1#	959#	1120								
ENDINI	1#	959#	4514								
ENDMOD	1#	959#	7587								
ENDMSG	1#	959#	3859	3898	3932	3976	4021	4056	4091	4126	
ENDPRO	1#	959#	4408								
ENDPTA	1#	959#									
ENDRPT	1#	959#									
ENDSEG	1#	959#									
ENDSET	1#	959#									
ENDSFT	1#	959#	7573								
ENDSRV	1#	959#									
ENDSUB	1#	959#	6979	7133							

IOSTAR 1# 959#
KT11 1# 959#
LASTAD 1# 959# 759#
MANUAL 1# 959#
MEMORY 1# 959#
MSG 4618# 4624 4752# 4758 5796# 5802 6057# 6063 6282# 6288 6506# 6512 6691# 6697 6874#
6880 7140# 7146
M$BYTE 1# 959# 986# 992 993 994
M$CHEC 1# 959# 4778# 6906#
M$CNTO 1# 959# 7523# 7528# 7533# 7539# 7545#
M$COUN 1# 959# 3305# 3316# 3327# 3344# 3854# 3873# 3888# 3909# 3918# 3927# 3942# 3950# 3958#
3967# 3987# 3995# 4003# 4012# 4032# 4040# 4048# 4067# 4075# 4083# 4102# 4110# 4118# 4157#
4165# 4175# 4182# 4192# 4199# 4209# 4216# 4233# 4241# 4251# 4258# 4268# 4282# 4290# 4300#
4307# 4317# 4324# 4334# 4341# 4359# 4367# 4377# 4384#
M$DATA 1# 959# 986# 995 997 999 1001 1003 1005 1007 1009 1011 1013 1015 1017
1019 1021 1023 1025# 1027 1029 1032 1035 1037 1039 1041 1043 1045 1047 1049
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                4604#  4617#  4643#  4645#  4653#  4655#  4675#  4677#  4687#  4689#  4700#  4702#  4710#  4712#  4723#
                4725#  4734#  4736#  4745#  4747#  4751#  4778#  4810#  4815#  4840#  4842#  4854#  4856#  4875#  4880#
                4895#  4900#  4908#  4913#  4921#  4926#  4935#  4940#  4948#  4953#  4961#  4966#  4974#  4979#  4987#
                4992#  5000#  5005#  5016#  5021#  5029#  5034#  5045#  5050#  5058#  5063#  5074#  5079#  5087#  5092#
                5103#  5108#  5116#  5121#  5132#  5137#  5145#  5150#  5158#  5163#  5174#  5179#  5187#  5192#  5203#
                5208#  5216#  5221#  5230#  5235#  5241#  5249#  5837#  5839#  5847#  5849#  5857#  5859#  5871#  5873#
                5881#  5883#  5891#  5893#  5901#  5903#  5911#  5913#  5920#  5922#  5931#  5933#  5947#  5949#  5958#
                5960#  5975#  5977#  5989#  5991#  6000#  6002#  6011#  6013#  6022#  6024#  6033#  6035#  6050#  6052#
                6056#  6098#  6100#  6108#  6110#  6118#  6120#  6132#  6134#  6142#  6144#  6152#  6154#  6161#  6163#
                6172#  6174#  6188#  6190#  6199#  6201#  6212#  6214#  6223#  6225#  6233#  6235#  6244#  6246#  6255#
                6257#  6266#  6268#  6275#  6277#  6281#  6322#  6324#  6332#  6334#  6342#  6344#  6356#  6358#  6366#
                6368#  6376#  6378#  6385#  6387#  6396#  6398#  6412#  6414#  6423#  6425#  6436#  6438#  6447#  6449#
                6457#  6459#  6468#  6470#  6479#  6481#  6490#  6492#  6499#  6501#  6505#  6541#  6543#  6563#  6565#
                6573#  6575#  6583#  6585#  6593#  6595#  6603#  6605#  6616#  6618#  6627#  6629#  6642#  6644#  6653#
                6655#  6664#  6666#  6675#  6677#  6690#  6726#  6728#  6748#  6750#  6758#  6760#  6768#  6770#  6778#
                6780#  6788#  6790#  6800#  6802#  6811#  6813#  6825#  6827#  6836#  6838#  6847#  6849#  6858#  6860#
```

```
                6873#  6906#  6911#  6936#  6941#  6955#  6960#  6974#  6981#  6990#  7028#  7033#  7047#  7052#  7059#
                7064#  7078#  7083#  7090#  7095#  7109#  7114#  7128#  7135#  7139#  7182#  7184#  7201#  7203#  7211#
                7213#  7221#  7223#  7231#  7233#  7241#  7243#  7250#  7252#  7261#  7263#  7271#  7273#  7282#  7284#
                7296#  7298#  7307#  7309#  7321#  7323#  7332#  7334#  7342#  7344#  7353#  7355#  7363#  7365#  7374#
                7376#  7384#  7386#  7395#  7397#  7412#  7414#  7423#  7425#  7440#  7442#  7454#  7456#  7465#  7467#
                7476#  7478#  7487#  7489#  7498#  7500#  7504#
M$WORD             1#   959#  1025#  1034  1084#  1086  1087  1088  1089  1090  1091  1092  1093  1094  4778#
                4810#  4811  4812  4813  4875#  4876  4877  4878  4895#  4896  4897  4898  4908#  4909  4910
                4911  4921#  4922  4923  4924  4935#  4936  4937  4938  4948#  4949  4950  4951  4961#  4962
                4963  4964  4974#  4975  4976  4977  4987#  4988  4989  4990  5000#  5001  5002  5003  5016#
                5017  5018  5019  5029#  5030  5031  5032  5045#  5046  5047  5048  5058#  5059  5060  5061
                5074#  5075  5076  5077  5087#  5088  5089  5090  5103#  5104  5105  5106  5116#  5117  5118
                5119  5132#  5133  5134  5135  5145#  5146  5147  5148  5158#  5159  5160  5161  5174#  5175
                5176  5177  5187#  5188  5189  5190  5203#  5204  5205  5206  5216#  5217  5218  5219  5230#
                5231  5232  5233  5241#  5242  5243  5244  6906#  6936#  6937  6938  6939  6955#  6956  6957
                6958  6974#  6975  6976  6977  7028#  7029  7030  7031  7047#  7048  7049  7050  7059#  7060
                7061  7062  7078#  7079  7080  7081  7090#  7091  7092  7093  7109#  7110  7111  7112  7128#
                7129  7130  7131  7523#  7528#  7533#  7539#  7545#  7592  7593
M$XFER             1#   959#
NEWTST          1648#  4618  4752  5796  6057  6282  6506  6691  6874  7140
NTST            1648#  4618  4752  5796  6057  6282  6506  6691  6874  7140
OPEN               1#   959#
POINTE             1#   959#   982
PRINTB             1#   959#  3853  3908  3917  3926  3941  3949  3957  3966  3986  3994  4002  4011  4031
                4039  4047  4066  4074  4082  4101  4109  4117  4267
PRINTF             1#   959#  3304  3315  3326  3343
PRINTS             1#   959#
PRINTX             1#   959#  3872  3887  4156  4164  4174  4181  4191  4198  4208  4215  4232  4240  4250
                4257  4281  4289  4299  4306  4316  4323  4333  4340  4358  4366  4376  4383
READBU             1#   959#
READEF             1#   959#  4436  4443  4450  4457
RFLAGS             1#   959#
SETDF           1648#  2107  2151  2198  2269  2368  2640  2744  2777  2788  2822  2833  2867  2878  2912
                2923  2957  2968  3000  3011  3047  3058  3071  3082  3114  3126  3499  3512  3538  3548
                3561  3571  3584  3594  3607  3617  3630  3640
SETHRD          1648#
SETPRI             1#   959#
SETSF           1648#
SETSFT          1648#
SETVEC             1#   959#  4536
SLASH              1#   959#  1076  1080
STARS              1#   959#
SVC                1#   957#   958
T$GEN           1648#  2107  2151  2198  2269  2368  2640  2744  2777  2788  2822  2833  2867  2878  2912
                2923  2957  2968  3000  3011  3047  3058  3071  3082  3114  3126  3499  3512  3538  3548
                3561  3571  3584  3594  3607  3617  3630  3640
XFER               1#   959#  4778#  6906#
XFERF              1#   959#
XFERT              1#   959#
$GEDF           1648#  4809  4874  4894  4907  4920  4934  4947  4960  4973  4986  4999  5015  5028  5044
                5057  5073  5086  5102  5115  5131  5144  5157  5173  5186  5202  5215  5229  5240  6935
                6954  6973  7027  7046  7058  7077  7089  7108  7127
$GEHRD          1648#
$GESF           1648#
$GESFT          1648#
$GTDF           1648#  2106  2150  2197  2268  2367  2639  2743  2776  2787  2821  2832  2866  2877  2911
```

```
          2922    2956    2967    2999    3010    3046    3057    3070    3081    3113    3125    3498    3511    3537    3547
          3560    3570    3583    3593    3606    3616    3629    3639
$GTHRD    1648#
$GTSF     1648#
$GTSFT    1648#


. ABS.  034514     000

 ERRORS DETECTED:  0

 CVDMEC,CVDMEC/SOL/CRF=SVC34R.MLB,CVDMEC.P11
 RUN-TIME: 33 41 4 SECONDS
 RUN-TIME RATIO: 104/79=1.3
 CORE USED:  20K  (39 PAGES)
```