DMP-11 M8203 STATIC DIAG.#1 AH-E232D-MC NOV 1980
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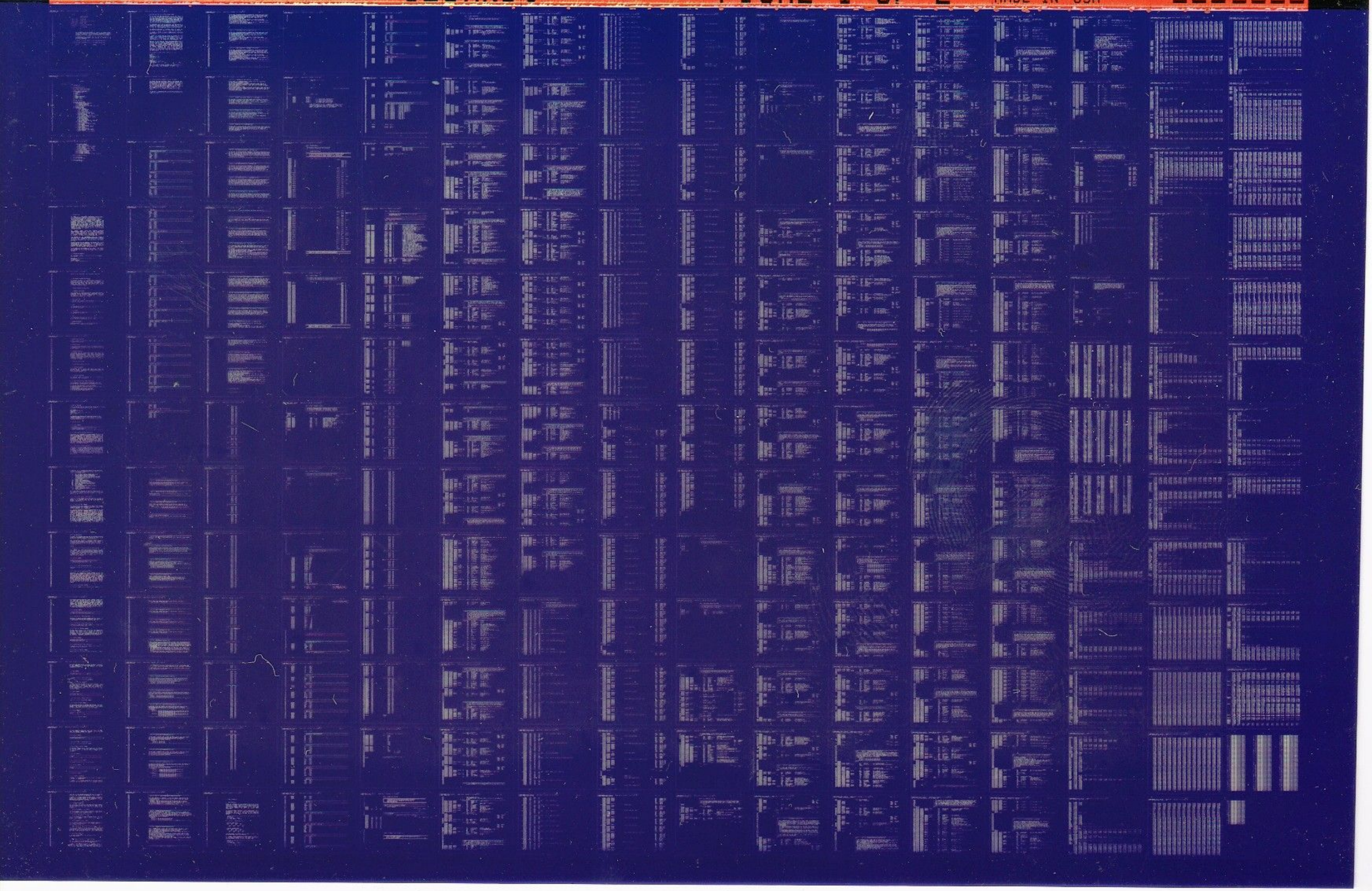

DMP-11 M8203 STATIC DIAG.#1 AH-E232D-MC NOV 1980
DMR-11 CZDMRDO FICHE 2 OF 2
MADE IN USA

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                    IDENTIFICATION
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PRODUCT CODE:   AC-E231D-MC

PRODUCT NAME:   CZDMRDO M8203 STATIC DIAG #1

PRODUCT DATE:   AUGUST 1980

MAINTAINER:     DIAGNOSTIC ENGINEERING

AUTHOR:         DAVID HOFFMAN
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CONTENTS

1.0 INTRODUCTION

THE M8203 IS A SINGLE-LINE SYNCHRONOUS LINE UNIT MODULE WHICH SUPPORTS BOTH CHARACTER-ORIENTED (DDCMP, BSC, ETC.) AND BIT-ORIENTED (SDLC, HDLC, ETC.) PROTOCOLS. THE PURPOSE OF THIS PROGRAM IS TO PERFORM DIAGNOSTIC TESTING OF ALL M8203 LOGIC IN A RELATIVELY STATIC MANNER. THE FOLLOWING FUNCTIONS WILL BE PERFORMED: LINE UNIT REGISTER ADDRESSING, USYRT ADDRESSING, STATIC BIT INTERACTION AND READ/WRITE LOGIC TESTS, BASIC TRANSMITTER AND RECEIVER SEQUENCING AND DATA BUFFERING AND STATIC OPERATIONS IN CHARACTER AND BIT-STUFFING MODES. IN ADDITION DATA MESSAGES WILL BE SENT AT SPEEDS OF 2400 BAUD TO 1 MEGABAUD, WITH LOOPBACK IN THE USYRT, ON THE LINE UNIT AT TTL LEVEL, OR THROUGH AN EXTERNAL TEST CONNECTOR WITH A SPECIFIC MODEM INTERFACE SELECTED.

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 WILL BE DESIGNED AND STRUCTURED TO ACHIEVE MAXIMUM FAULT RESOLUTION AND FACILITATE REPLACEMENT OF THE SMALLEST FIELD REPLACEABLE UNIT.

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

THROUGH DIALOGUE WITH THE OPERATOR, THE PROGRAM WILL ALLOW MODIFICATION OF DEVICE PARAMETERS, SUCH AS UNIBUS 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 M8203 STATIC LOGIC TESTS:

PDP-11/04,05,10,20,30,34,35,40,45,50,60, OR 70
16K MEMORY
CONSOLE TERMINAL
DMC-11 OR KMC-11 MICROPROCESSOR

M8203 LINE UNIT AND BC08S-1 CABLE AND BERG CONNECTORS

3.0 PRELIMINARY PROGRAM REQUIREMENTS

THIS PROGRAM OPERATES THE MICROPROCESSOR EXTENSIVELY IN ORDER TO TEST THE LINE INIT. FOR THIS REASON, THE MICROPROCESSOR DIAGNOSTIC AND SUBSYSTEM FUNCTIONAL TESTS SHOULD BE RUN FIRST, AND ANY FAULTS FOUND IN THE MICROPROCESSOR MODULE SHOULD BE REPAIRED, PRIOR TO RUNNING THE M8203 STATIC LOGIC TESTS.

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 THE M8203 STATIC LOGIC TESTS IS ABOUT 45 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. IF IT IS INSTALLED, IT IS DISABLED BY THE PROGRAM.

```
                                4.7 MEMORY PARITY OPTION

                                IF PARITY MEMORY IS INSTALLED, MEMORY PARITY TRAPS ARE
                                DISABLED BY THE PROGRAM.


                                4.8 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
                        CZDMR-D-0
                        M8203 STATIC LOGIC TESTS - PART 1 OF 2
                        UNIT IS M8203
                        D?>

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


                        6.3 PROGRAM OPTIONS


                        6.3.1 START COMMAND

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


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

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


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

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


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

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

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

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

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

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

6.3.1.5 EFFECT OF START COMMAND

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

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

```
286                     AFTER THE PARENTHESES.
287
288                     FOLLOWING  THE HARDWARE QUESTIONS ARE THE SOFTWARE QUESTIONS
289                     TO BUILD THE SOFTWARE TABLES, WHICH DEFINE THE  MODE  (QUICK
290                     VERIFY ETC.) THAT THE DIAGNOSTIC WILL EXECUTE IN.
291
292                     WHEN  THE QUESTION "# UNITS?" IS ANSWERED, MEMORY STORAGE IS
293                     ALLOCATED FOR THE P-TABLES, AND IF THERE IS  NOT  ENOUGH  TO
294                     ACCOMMODATE THEM THE MESSAGE "TOO MANY UNITS" IS ISSUED.  IN
295                     THIS CASE THE DIAGNOSTIC MUST BE EXECUTED MORE THAN ONCE  TO
296                     TEST ALL UNITS.
297
298                     EXAMPLE:
299
300                     STA/TESTS:1:2-4:6:8-10/PASS:3/FLAGS:IER:HOE=1:UAM:LOE
301
302                     THIS  COMMAND  WILL CAUSE THREE PASSES TO BE MADE, EACH PASS
303                     CONSISTING OF TESTS 1,2,3,4,6,8,9, AND 10  EXECUTED  AGAINST
304                     ALL UNITS.  THERE IS NO DIFFERENCE BETWEEN SAYING <FLAG> AND
305                     SAYING <FLAG=1>. THE NOTATION <FLAG=0> IS MEANINGFUL ONLY ON
306                     A  COMMAND  OTHER  THAN  START  TO  CLEAR  A  FLAG  THAT WAS
307                     PREVIOUSLY SET.  NOTE THAT ON ALL COMMANDS  ONLY  THE  FIRST
308                     THREE LETTERS ARE SCANNED.
309
310
311                     6.3.2 RESTART COMMAND
312
313                     ****************************************************************
314                     RES(TART)/TESTS:<TEST-LIST>/PASS:<PASS-CNT>/FLAGS:
315                        <FLAG-LIST>/UNITS:<UNIT-LIST>
316                     ****************************************************************
317
318
319                     6.3.2.1 TESTS, PASS, AND FLAGS SWITCHES
320
321                     <TEST-LIST>, <PASS-CNT>, AND <FLAG-LIST> ARE AS IN THE START
322                     COMMAND.
323
324
325                     6.3.2.2 UNITS SWITCH (/UNITS:<UNIT-LIST>)
326
327                     <UNIT-LIST>  IS  A SEQUENCE OF DECIMAL NUMBERS (0,1 ETC.) OR
328                     RANGES OF DECIMAL NUMBERS (0-5, 8-10 ETC.) THAT SPECIFY  THE
329                     UNITS  TO  BE  TESTED.  THE NUMBERS ARE SEPARATED BY COLONS.
330                     THE NUMBERS MAY RANGE FROM 0 THRU N-1  (N  IS  THE  NUMBER  OF
331                     UNITS  SPECIFIED IN THE PREVIOUS START COMMAND).  THE NUMBER
332                     INDICATES THE POSITION  OF  THE  P-TABLE  AS  THE  DATA  WAS
333                     ENTERED  DURING THE HARDWARE DIAGLOGUE.  THE UNITS WHICH ARE
334                     SELECTED MUST NOT HAVE BEEN DROPPED  BY  THE  DROP  COMMAND.
335                     SEE  THE DISCUSSION OF ADD AND DROP COMMANDS BELOW.  DEFAULT
336                     IS TO TEST ALL UNITS WHICH HAVE NOT BEEN DROPPED BY  A  DROP
337                     COMMAND.
338
339
340                     6.3.2.3 EFFECT OF RESTART COMMAND
341
342                     THE  RESTART  COMMAND DIFFERS FROM THE START COMMAND IN THAT
```

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

6.3.3 CONTINUE COMMAND

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

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

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

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

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

6.3.3.3 EFFECT OF CONTINUE COMMAND

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

6.3.4 PROCEED COMMAND

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

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

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

6.3.4.2 EFFECT OF PROCEED COMMAND

PROCEED MUST FOLLOW A START, RESTART, OR CONTINUE. COMMAND

```
400                     MODE MUST HAVE BEEN ENTERED VIA A HALT ON ERROR.  THE EFFECT
401                     OF  THE  COMMAND  IS  TO  BEGIN  EXECUTION  AT  THE LOCATION
402                     FOLLOWING THE ERROR CALL.   NEITHER  HARDWARE  NOR  SOFTWARE
403                     PARAMETERS MAY BE ALTERED.
404
405
406
407                     6.3.5 ADD COMMAND
408
409                     ************************************************************
410                     ADD/UNITS:<UNIT-LIST>
411                     ************************************************************
412
413
414                     6.3.5.1 UNITS SWITCH (/UNITS:<UNIT-LIST>
415
416                     <UNIT-LIST> IS AS IN THE RESTART COMMAND.
417
418
419                     6.3.5.2 EFFECT OF ADD COMMAND
420
421                     THE UNITS SPECIFIED ARE ADDED TO THE  TEST  SEQUENCE.   EACH
422                     UNIT  MUST  HAVE  A  P-TABLE  IN  MEMORY  DUE  TO AN EARLIER
423                     HARDWARE DIALOGUE.  THIS  COMMAND  MUST  BE  FOLLOWED  BY  A
424                     RESTART  OR  CONTINUE.   THE UNITS SWITCH MUST BE SPECIFIED.
425                     THE ADD COMMAND IS  MEANINGFUL  ONLY  FOR  UNITS  THAT  WERE
426                     PREVIOUSLY DROPPED.
427
428
429                     6.3.6 DROP COMMAND
430
431                     ************************************************************
432                     DRO(P)/UNITS:<UNIT-LIST>
433                     ************************************************************
434
435
436                     6.3.6.1 UNITS SWITCH (/UNITS:<UNIT-LIST>)
437
438                     <UNIT-LIST> IS AS IN THE RESTART COMMAND.
439
440
441                     6.3.6.2 EFFECT OF DROP COMMAND
442
443                     THE UNITS SPECIFIED WILL BE DROPPED FROM TESTING.  THE UNITS
444                     WILL BE RESELECTED ONLY BY THE EXECUTION OF AN ADD OR  START
445                     COMMAND.   THE  UNITS  SWITCH MUST BE ENTERED.  THIS COMMAND
446                     MUST BE FOLLOWED BY A RESTART OR A CONTINUE COMMAND.
447
448
449                     6.3.7 PRINT COMMAND
450
451                     ************************************************************
452                     PRI(NT)
453                     ************************************************************
454
455
456                     6.3.7.1 EFFECT OF PRINT COMMAND
```

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

6.3.8 DISPLAY COMMAND

****
D!S(PLAY)/UNITS:<UNIT-LIST>
****

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

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

6.3.8.2 EFFECT OF DISPLAY COMMAND

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

6.3.9 FLAGS COMMAND

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

6.3.9.1 EFFECT OF FLAGS COMMAND

THE CURRENT SETTINGS OF ALL FLAGS ARE PRINTED.

6.3.10 ZFLAGS COMMAND

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

6.3.10.1 EFFECT OF ZFLAGS COMMAND

ALL FLAGS ARE CLEARED.

6.3.11 CONTROL CHARACTERS

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

A CONTROL Z (Z) ENTERED DURING ONE OF THE THREE OPERATOR DIALOGUES- HARD CORE QUESTIONS (SEE 6.2),HARDWARE DIALOGUE

(SEE 6.3.1.5), OR SOFTWARE DIALOGUE (SEE 6.3.1.5) CAUSES THE DEFAULTS TO BE TAKEN FOR THE REMAINDER OF THAT DIALOGUE.

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

6.3.12 HARDWARE PARAMETERS

THE FOLLOWING 4 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) 160170?

THIS IS THE ADDRESS AT WHICH THE CSR REGISTERS (SELO) RESIDE ON THE UNIBUS. THE ALLOWABLE RANGE IS 160000-177776 (OCTAL), AND THE DEFAULT VALUE IS 160170.

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) 5 ?

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 5.

4. M8207 RUN SWITCH (E28 SW7) - TYPE 0 IF OFF, 1 IF ON : (O) 1 ?

THIS TELLS THE PROGRAM IF THE RUN SWITCH ON THE MICROPROCESSOR IS SET OR NOT. IF IT IS SET, RUN IS NOT INHIBITED, AND TESTS REQUIRING THE RUN STATE CAN BE EXECUTED. THE ALLOWABLE VALUES ARE 0 AND 1, AND THE DEFAULT VALUE IS 1 (RUN IS NOT INHIBITED).

6.3.13 SOFTWARE PARAMETERS

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

6.3.14 EXTENDED DISCUSSION OF P-TABLE DIALOGUE

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

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

```
                        QUESTIONS AND THE SLOTS IN THE P-TABLE FORMAT.

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

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

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

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

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

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

                        THE FOLLOWING DIALOGUE WOULD ACCOMPLISH THIS GOAL:

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

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

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

```
                        SLOT THREE RECEIVES A CONSTANT 76 IN ALL 16 TABLES.

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

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

```
                                7.0 DEVICE INFORMATION TABLES



                        ;*****************************************************************************
                        * MAINTENANCE REGISTER - BSEL1
                        ;*****************************************************************************
                        RUN     = BIT7
                        MCLR    = BIT6
                        STEPLU  = BIT4
                        LULOOP  = BIT3
                        ROMO    = BIT2
                        ROMI    = BIT1
                        STEPMP  = BIT0

                        ;*****************************************************************************
                        * OBUS REG 10 - TRANSMITTER BUFFER
                        ;*****************************************************************************
                        TX7     = BIT7
                        TX6     = BIT6
                        TX5     = BIT5
                        TX4     = BIT4
                        TX3     = BIT3
                        TX2     = BIT2
                        TX1     = BIT1
                        TX0     = BIT0

                        ;*****************************************************************************
                        * OBUS REG 11
                        ;*****************************************************************************
                        OC      = BIT7
                        GOAH    = BIT3
                        ABORT   = BIT2
                        EOM     = BIT1
                        SOM     = BIT0

                        ;*****************************************************************************
                        * OBUS REG 12
                        ;*****************************************************************************
                        IC      = BIT7
                        BPOLL   = BIT6
                        LULP    = BIT5

                        ;*****************************************************************************
                        * OBUS REG 13
                        ;*****************************************************************************
                        POLL    = BIT7
                        DTR     = BIT6
                        SELFR   = BIT5
                        HDX     = BIT4
                        MAINT1  = BIT3
                        MAINT2  = BIT2
                        SELSBY  = BIT1

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

```
                        * OBUS REG 14
                        ;*****************************************************************************
                        TXEN    = BIT6
                        DISSI   = BIT5
                        RDAX    = BIT4
                        WAX     = BIT3
                        ENAX    = BIT2
                        AX2     = BIT1
                        AX1     = BIT0

                        ;*****************************************************************************
                        * OBUS REG 17
                        ;*****************************************************************************
                        CRC2    = BIT7
                        CRC1    = BIT6
                        IDLE    = BIT5
                        SECA    = BIT4
                        STRIP   = BIT3
                        RDALL   = BIT2
                        IERR    = BIT1
                        DDCMP   = BIT0

                        ;*****************************************************************************
                        * IBUS REG 10 - RECEIVER BUFFER
                        ;*****************************************************************************
                        RX7     = BIT7
                        RX6     = BIT6
                        RX5     = BIT5
                        RX4     = BIT4
                        RX3     = BIT3
                        RX2     = BIT2
                        RX1     = BIT1
                        RX0     = BIT0

                        ;*****************************************************************************
                        * IBUS REG 11
                        ;*****************************************************************************
                        OC      = BIT7
                        OACT    = BIT6
                        SW3     = BIT5
                        ORDY    = BIT4
                        SW2     = BIT3
                        SW1     = BIT2
                        SW0     = BIT1
                        UNRR    = BIT0

                        ;*****************************************************************************
                        * IBUS REG 12
                        ;*****************************************************************************
                        IC      = BIT7
                        IACT    = BIT6
                        LULP    = BIT5
                        IRDY    = BIT4
                        OVRR    = BIT3
                        RAB     = BIT2
                        EBLK    = BIT1
                        BCC     = BIT0
```

```
                        ;*****************************************************************************
                        * IBUS REG 13
                        ;*****************************************************************************
                        RING    = BIT7
                        DTR     = BIT6
                        RTS     = BIT5
                        HDX     = BIT4
                        MODR    = BIT3
                        CS      = BIT2
                        STBY    = BIT1
                        CARR    = BIT0

                        ;*****************************************************************************
                        * IBUS REG 14
                        ;*****************************************************************************
                        READY   = BIT7
                        TXEN    = BIT6
                        DISSI   = BIT5
                        RDAX    = BIT4
                        WAX     = BIT3
                        ENAX    = BIT2
                        AX2     = BIT1
                        AX1     = BIT0

                        ;*****************************************************************************
                        * IBUS REG 17
                        ;*****************************************************************************
                        SIGR    = BIT7
                        SIGQ    = BIT6
                        TXDATA  = BIT5
                        OCOR    = BIT4
                        ICIR    = BIT3
                        TESTMD  = BIT2
                        MCLK  = BIT1
                        DDCMP   = BIT0

                        ;*****************************************************************************
                        * AX0-15 - USYRT REG 0 (READ ONLY)
                        ;*****************************************************************************
                        RX7     = BIT7
                        RX6     = BIT6
                        RX5     = BIT5
                        RX4     = BIT4
                        RX3     = BIT3
                        RX2     = BIT2
                        RX1     = BIT1
                        RX0     = BIT0

                        ;*****************************************************************************
                        * AX0-16 - USYRT REG 1 (READ ONLY)
                        ;*****************************************************************************
                        RERR    = BIT7
                        ASBC2   = BIT6
                        ASBC1   = BIT5
                        ASBC0   = BIT4
                        ROR     = BIT3
```

```
                        RABT    = BIT2
                        REOM    = BIT1
                        RSOM    = BIT0

                        ;*****************************************************************************
                        * AX1-15 - USYRT REG 2
                        ;*****************************************************************************
                        TX7     = BIT7
                        TX6     = BIT6
                        TX5     = BIT5
                        TX4     = BIT4
                        TX3     = BIT3
                        TX2     = BIT2
                        TX1     = BIT1
                        TX0     = BIT0

                        ;*****************************************************************************
                        * AX1-16 - USYRT REG 3
                        ;*****************************************************************************
                        TERR    = BIT7
                        TXGA    = BIT3
                        TXAB    = BIT2
                        TEOM    = BIT1
                        TSOM    = BIT0

                        ;*****************************************************************************
                        * AX2-15 - USYRT REG 4
                        ;*****************************************************************************
                        SYN7    = BIT7
                        SYN6    = BIT6
                        SYN5    = BIT5
                        SYN4    = BIT4
                        SYN3    = BIT3
                        SYN2    = BIT2
                        SYN1    = BIT1
                        SYN0    = BIT0
                        SYNCH   = 226

                        ;*****************************************************************************
                        * AX2-16 - USYRT REG 5
                        ;*****************************************************************************
                        APA     = BIT7
                        DDC     = BIT6
                        STR     = BIT5
                        SEC     = BIT4
                        IDL     = BIT3
                        CRCTY2  = BIT2
                        CRCTY1  = BIT1
                        CRCTY0  = BIT0

                        ;*****************************************************************************
                        * AX3-15 - USYRT REG 6
                        ;*****************************************************************************
                        I422    = BIT7
                        XYZ     = BIT6
                        C32BCC  = BIT5
                        V35     = BIT4
```

```
                        INTGRL  = BIT3
                        C32ENB  = BIT2
                        OP      = BIT1
                        TEST    = BIT0
                        AX315U  = 1422!XYZ!C32BRC!V35!INTGRL!OP

                        ;*****************************************************************************
                        * AX3-16 - USYRT REG 7
                        ;*****************************************************************************
                        ;
                        TXLEN2  = BIT7
                        TXLEN1  = BIT6
                        TXLEN0  = BIT5
                        RXLEN2  = BIT2
                        RXLEN1  = BIT1
                        RXLEN0  = BIT0
```

```
                                8.0 TEST DESCRIPTIONS




                        ;*****************************************************************************
                            TEST 1 - MICROPROCESSOR CSR ADDRESSING TEST (SEL0)
                        *
                        * THIS TEST ADDRESSES THE FIRST MICROPROCESSOR CSR (SEL0), TO MAKE SURE
                        * THAT A NON-EXISTENT MEMORY TIME-OUT TRAP DOES NOT OCCUR WHILE
                        * ATTEMPTING TO ADDRESS THE MICROPROCESSOR.
                        ;*****************************************************************************




                        ;*****************************************************************************
                            TEST 2 - INBUS/OUTBUS REG 14 INITIALIZATION TEST
                        *
                        * MASTER CLEAR (MCLR) IS SET IN THE MICROPROCESSOR, IBUS REG 14 IS READ
                        * AND COMPARED TO 200.
                        ;*****************************************************************************




                        ;*****************************************************************************
                            TEST 3 - INBUS/OUTBUS REG 14 READ/WRITE BIT TEST
                        *
                        * WRITE, READ, AND COMPARE ALL WORDS OF DATA PATTERN A INTO REG 14,
                        * A BYTE AT A TIME. NON-R/W BITS ARE MASKED OFF TO 0 BEFORE WRITING AND
                        * READING.
                        *    DATA PATTERN A = 125,252,000,377,001,002,004,010,020,040,100,200,376,
                        *                     375,373,367,357,337,277,177.
                        ;*****************************************************************************




                        ;*****************************************************************************
                            TEST 4 - REG 14 MASTER CLEAR TEST
                        * WRITE 377 INTO REG 14, ISSUE MASTER CLEAR, READ REG 14 AND COMPARE
                        * TO 200.
                        ;*****************************************************************************
```

```
                        ;*****************************************************************************
                            TEST 5 - REG 14 UNIBUS RESET (INIT) TEST
                        * WRITE 377 INTO REG 14, ISSUE UNIBUS RESET (INIT), READ REG 14 AND COMPARE
                        * TO 200.
                        ;*****************************************************************************
                        ;*****************************************************************************
                            TEST 6 - LINE UNIT FALSE SELECTION TEST
                        *
                        * FIRST, A MASTER CLEAR IS PERFORMED. THEN, THE PROGRAM SINGLE-STEPS THE
                        * MICROPROCESSOR THROUGH AN INSTRUCTION WHICH LOADS 041 (OCT) INTO THE MAR
                        * REGISTER (OBUS* ADRS 14). THEN, THE LINE UNIT REGISTER 14 IS READ AND CHECKED
                        * TO BE UNAFFECTED (STILL = 0). THIS TEST IS INTENDED TO DETECT A FALSE
                        * SELECTION OF THE LINE UNIT REGISTERS, WHEN THE LINE UNIT IS NOT BEING
                        * ACCESSED.
                        ;*****************************************************************************
                        ;*****************************************************************************
                            TEST 7 - INBUS REG MASTER CLEAR TEST
                        *
                        * FIRST, ALL READ/WRITE BITS OF REGS 10-17 ARE SET BY LOADING A
                        * DIFFERENT WORD OF PATTERN G INTO EACH REG.  THEN,
                        * A MASTER CLEAR IS ISSUED AND EACH REG IS READ AND COMPARED TO A WORD OF
                        * PATTERN M, WHICH CONTAINS THE INITIALIZED STATES OF THE REGS. (UNPREDICTABLE
                        * BITS ARE MASKED OFF TO 0 BEFORE COMPARISON).
                        *   PATTERN G = 000,000,240,120,177,000,000,001
                        *   PATTERN M = 000,020,000,000,200,000,000,051
                        ;*****************************************************************************
                        ;*****************************************************************************
                            TEST 8 - REGISTER 10-17 ADDRESSING TEST
                        *
                        * FIRST, A MASTER CLEAR IS ISSUED. THEN,
                        * WRITE A DIFFERENT WORD OF DATA PATTERN B INTO EACH OF REGS 10-17,
                        * AND AFTER EACH WRITE, READ AND COMPARE ALL REGS TO EXPECTED VALUES.
                        * UNPREDICTABLE BITS ARE MASKED OFF TO 0 WHEN READ FOR COMPARISON.
                        *    PATTERN B = 000,000,040,100,220,000,000,051
                        ;*****************************************************************************
                        ;*****************************************************************************
                            TEST 9 - REG 11 READ/WRITE BIT TEST
```

```
                        *
                        * WRITE, READ, AND COMPARE EACH WORD OF DATA PATTERN C INTO REG 11 :
                        *     DATA PATTERN C = 020,020,020.
                        ;*****************************************************************************
                        ;*****************************************************************************
                            TEST 10 - REG 12 READ/WRITE BIT TEST
                        *
                        * WRITE, READ, AND COMPARE EACH WORD OF DATA PATTERN D INTO REG 12 :
                        *     DATA PATTERN D = 000,040,000.
                        ;*****************************************************************************
                        ;*****************************************************************************
                            TEST 11 - REG 13 READ/WRITE BIT TEST
                        *
                        * WRITE, READ, AND COMPARE EACH WORD OF DATA PATTERN E INTO REG 13 :
                        *     DATA PATTERN E = 000,120,020,100,120,000.
                        ;*****************************************************************************
                        ;*****************************************************************************
                            TEST 12 - REG 17 READ/WRITE BIT TEST
                        *
                        * WRITE, READ, AND COMPARE EACH WORD OF DATA PATTERN F INTO REG 17 :
                        *     DATA PATTERN F = 050,051,050.
                        ;*****************************************************************************
                        ;*****************************************************************************
                            TEST 13 - MAINTENANCE CLOCK BIT TEST
                        *
                        * FIRST, A MASTER CLEAR IS ISSUED TO INIT ALL REGS. THEN, THE MICROPROCESSOR
                        * IS PLACED IN A LOOP ON AN INSTRUCTION, BY SETTING THE INSTRUCTION IN SEL6
                        * AND SETTING ROMI AND RUN IN BSEL1. THE INSTRUCTION IS ONE WHICH REPETITIVELY
                        * READS LINE UNIT REG 17 INTO BSEL2. THE PDP-11 CAN THEN SCAN BSEL2 TO MONITOR
                        * THE MAINTENANCE CLOCK BIT, MCLK. THE FOLLOWING SEQUENCE IS THEN PERFORMED
                        * TO MONITOR MCLK :
                        * - THE PROGRAM REPEATEDLY CHECKS THE MCLK BIT FOR THE 1 STATE, AND IF IT IS
                        *   NOT FOUND WITHIN SEVERAL HUNDRED MILLI-SEC (DEPENDING ON THE PROCESSOR)
                        *   AN ERROR IS REPORTED. (THE MAINTENANCE CLOCK HAS A PERIOD OF 41.6 MICRO-
                        *   SEC).
                        * - THE PROGRAM NEXT REPEATEDLY CHECKS THE MCLK BIT FOR THE 0 STATE, AND IF
                        *   IT IS NOT FOUND WITHIN SEVERAL HUNDRED MILLI-SEC AN ERROR IS REPORTED.
```

```
                        * - THE PROGRAM NEXT REPEATEDLY CHECKS MCLK BIT FOR THE 1 STATE AGAIN, AND
                        *   IF IT IS NOT FOUND WITHIN SEVERAL HUNDRED MILLI-SEC, AN ERROR IS REPORTED.
                        *
                        * IF THE P-TABLE FOR THIS UNIT INDICATES THAT THE M8207 RUN SWITCH (E28 SW7)
                        * IS OFF, THE TEST WILL BE SKIPPED.
                        ;*****************************************************************************
                        ;*****************************************************************************
                        ;   TEST 14 - EXTENDED REGISTER MASTER CLEAR TEST
                        *
                        * FIRST, ALL READ/WRITE BITS OF EXTENDED REGS AX0-AX3 ARE SET BY LOADING
                        * A DIFFERENT WORD OF PATTERN H INTO EACH REG. THEN, A MASTER CLEAR IS
                        * ISSUED AND EACH REG IS READ AND COMPARED TO A WORD OF PATTERN I, WHICH
                        * CONTAINS THE INITIALIZED STATES OF ALL THE EXTENDED REGS.
                        *    PATTERN H = 000,000,377,017,377,377,375,377
                        *    PATTERN I = 000,000,000,000,000,103,000,000
                        ;*****************************************************************************
                        ;*****************************************************************************
                        ;   TEST 15 - EXTENDED REGISTER ADDRESSING TEST
                        *
                        * FIRST, ISSUE A MASTER CLEAR TO PUT REGS INTO INITIALIZED STATES SHOWN IN
                        * PATTERN I. THEN, WRITE A DIFFERENT WORD OF PATTERN J INTO EACH EXTENDED (AX)
                        * REG, AND AFTER EACH WRITE, READ AND COMPARE ALL EXTENDED REGS TO EXPECTED
                        * VALUES.
                        *   PATTERN I = 000,000,000,000,000,103,000,000
                        *   PATTERN J = 000,000,001,002,004,103,040,100
                        ;*****************************************************************************
                        ;*****************************************************************************
                        ;   TEST 16 - REGS 15,16 / AX2-15,AX2-16 READ/WRITE BIT TEST
                        *
                        * USING REGS 15,16, THE INDIRECT REGS AX2-15,AX2-16 (USYRT REGS 4,5) ARE
                        * WRITTEN AND READ USING EACH WORD OF PATTERN K. AX2-15 IS COMPARED
                        * TO THE WORD WRITTEN, AND AX2-16 IS ALWAYS COMPARED TO 103. (AX2-16 IS NOT
                        * WRITEABLE).
                        *    PATTERN K =
                        *      FOR REG 15: 000,377,125,252,001,002,004,010,020,040,100,200,000,000,
                        *                  000,000,000,000,000,000,376,375,373,367,357,337,277,177,
                        *                  377,377,377,377,377,377,377,377
                        *      FOR REG 16: 000,377,125,252,000,000,000,000,000,000,000,000,001,002,
                        *                  004,010,020,040,100,200,377,377,377,377,377,377,377,377,
                        *                  376,375,373,367,357,337,277,177.
                        ;*****************************************************************************
```

```
                ;*****************************************************************************
                    TEST 17 - AX0-15,AX0-16 READ/WRITE BIT TEST
                *
                * IN THIS TEST, A MASTER CLEAR IS DONE, AND THEN A WRITE, READ, AND COMPARE
                * ARE PERFORMED IN REGS AX0-15,AX0-16 USING EACH WORD OF PATTERN L.
                * ANY BITS IN AX0-15,AX0-16 WHICH ARE NOT READ/WRITE ARE MASKED OFF (TO 0)
                * IN THE EXPECTED VALUE BEFORE COMPARISON.
                *    PATTERN L =
                *       FOR REG 15: 000,377,000
                *       FOR REG 16: 000,377,000.
                ;*****************************************************************************




                ;*****************************************************************************
                    TEST 18 - AX1-15,AX1-16 READ/WRITE BIT TEST
                *
                * IN THIS TEST, A MASTER CLEAR IS DONE, AND THEN A WRITE, READ, AND COMPARE
                * ARE PERFORMED IN REGS AX1-15,AX1-16 USING EACH WORD OF PATTERN K.
                * ANY BITS IN AX1-15,AX1-16 WHICH ARE NOT READ/WRITE ARE MASKED OFF (TO 0)
                * IN THE EXPECTED VALUE BEFORE COMPARISON.
                ;*****************************************************************************




                ;*****************************************************************************
                    TEST 19 - AX3-15,AX3-16 READ/WRITE BIT TEST
                *
                * IN THIS TEST A MASTER CLEAR IS DONE AND THEN A WRITE, READ, AND COMPARE ARE
                * PERFORMED IN REGS AX3-15,AX3-16 USING EACH WORD OF PATTERN V FOR WRITING,
                * AND PATTERN U FOR COMPARING.
                * ANY BITS IN AX3-15,AX3-16 WHICH ARE NOT READ/WRITE ARE MASKED OFF (TO 0)
                * IN THE EXPECTED VALUE BEFORE COMPARISON.
                *   PATTERN V =
                *       FOR REG 15 : 000,333,331,323,313,233,133,000,000,000,000,
                *                    000,000,000,000,000,000,000,000
                *       FOR REG 16 : 000,000,000,000,000,000,000,001,002,004,040,
                *                    100,200,346,345,343,307,247,147
                *   PATTERN U =
                *       FOR REG 15 : 000,001,013,011,021,101,301,000,000,000,000,
                *                    000,000,000,000,000,000,000,000
                *       FOR REG 16 : 000,000,000,000,000,000,000,001,002,004,040,
                *                    100,200,346,345,343,307,247,147
                ;*****************************************************************************
```

```
                                ;*****************************************************************************
                                    TEST 20 - REG 17 - AX2-16 READ/WRITE, MASTER CLEAR TEST
                                *
                                * THIS TEST CONSISTS OF 2 SUBTESTS. IN THE FIRST SUBTEST, EACH BYTE OF PAT O
                                * IS WRITTEN INTO REG 17 AND AFTER EACH WRITE, AX2-16 IS READ AND COMPARED
                                * TO A BYTE OF PAT P.
                                *   PATTERN O = 000,041,004,010,020,040,100,101,200,201,300,111,301,375
                                *   PATTERN P = 000,113,200,040,020,010,001,104,007,105,007,144,107,157
                                * IN THE SECOND SUBTEST, REG 17 IS LOADED WITH 375, A MASTER CLEAR IS ISSUED,
                                * AND AX2-16 IS COMPARED TO ITS INITIALIZED STATE (103).
                                ;*****************************************************************************
                                ;*****************************************************************************
                                    TEST 21 - TRANSMITTER BUFFER DATA TEST
                                * A MASTER CLEAR IS DONE FIRST, AND THEN A BYTE OF PATTERN N IS LOADED INTO
                                * REG 11 AND THE NEXT BYTE IS LOADED TWICE INTO REG 10. THE PROGRAM THEN WAITS
                                * AT LEAST 50 MICRO-SEC, AND THEN IT READS AND COMPARES AX1-15 TO THE BYTE WHICH
                                * WAS LOADED INTO REG 10, AND IT READS AND COMPARES AX1-16 TO THE BYTE WHICH WAS
                                * LOADED INTO REG 11. THIS PROCESS IS REPEATED (INCLUDING THE MASTER CLEAR)
                                * FOR EACH PAIR OF BYTES IN PATTERN N.
                                *   PATTERN N =
                                *     FOR REG 10: 000,125,252,377,000,000,000
                                *     FOR REG 11: 000,000,000,000,005,012,017
                                ;*****************************************************************************
                                ;*****************************************************************************
                                    TEST 22 - TRANSMITTER BUFFER SEQUENCING TEST
                                *
                                * FIRST, A MASTER CLEAR IS DONE, AND THE PROGRAM CHECKS FOR ORDY=1, OCOR=0.
                                * THEN, 2 TSOM CHARS ARE LOADED INTO THE TX SILO, AND ALLOWED TO RIPPLE
                                * DOWN TO THE OUTPUT. THE PROGRAM CHECKS FOR ORDY=1, OCOR=1.
                                * NEXT, THE PROGRAM CYCLES THE STEPLU BIT UNTIL OCOR=0 AGAIN, AND CHECKS FOR
                                * THIS TO OCCUR WITHIN 3 CYCLES.
                                * THE SILO IS THEN FILLED WITH 64 BYTES OF A 256-BYTE BINARY COUNT PATTERN
                                * (000-377) AND THE PROGRAM CHECKS FOR ORDY=0 AFTER THE 64TH CHAR IS LOADED.
                                * THE PROGRAM CYCLES STEPLU FOR 8 CYCLES AND CHECKS THAT AFTER THE 8TH, ORDY=1.
                                * AX1-15 IS READ AND COMPARED TO EXPECTED DATA.
                                * THE REST OF THE BINARY COUNT DATA BYTES ARE LOADED, CYCLED 8 CLOCKS, READ AND
                                * COMPARED, A BYTE AT A TIME. UPON COMPLETION, THE SILO IS CHECKED TO BE EMPTY
                                * WITH ORDY=1, OCOR=0.
                                ;*****************************************************************************
                                ;*****************************************************************************
                                    TEST 23 - TX MSG TIMING TEST, CHAR MODE, WITH CRC
                                *
```

```
                        * IN THIS TEST, AN ENTIRE MESSAGE IS TRANSMITTED (USING STEPLU AND LULOOP)
                        * AND THE PROGRAM MONITORS THE OCCURRENCE OF USYRT TX BUFFER EMPTY FLAGS
                        * (BY SCANNING ORDY AND OCOR) AND OACT, AT EACH STEP. THE TEST IS DONE IN
                        * CHARACTER ORIENTED PROTOCOL MODE, USING 8-BIT CHARS AND CRC-16.
                        * THE FOLLOWING STEPS ARE DONE:
                        * A MASTER CLEAR IS DONE, AND THE LINE UNIT IS PLACED IN CHAR MODE.
                        * SOM IS SET TWICE TO SEND 2 SYNCH CHARS. THEN, 2 000 CHARS ARE SENT, AND
                        * THEN 2 TERMINATING SYNCHS ARE SENT.
                        * THE TRANSMITTER IS THEN DISABLED, USING OC, AND OACT IS MONITORED FOR THE
                        * CLEARED STATE AFTER THE 3RD SYNCH COMPLETES.
                        ;*****************************************************************************
                        ;*****************************************************************************
                            TEST 24 - TX MSG TIMING TEST, BIT MODE, WITH CRC
                        *
                        * IN THIS TEST, AN ENTIRE MESSAGE IS TRANSMITTED (USING STEPLU AND LULOOP)
                        * AND THE PROGRAM MONITORS THE OCCURRENCE OF USYRT TX BUFFER EMPTY FLAGS
                        * (BY SCANNING ORDY AND OCOR) AND OACT, AT EACH STEP. THE TEST IS DONE IN
                        * BIT ORIENTED PROTOCOL MODE, USING 8-BIT CHARS AND CRC-CCITT-1.
                        * THE FOLLOWING STEPS ARE DONE:
                        * A MASTER CLEAR IS DONE, AND THE LINE UNIT IS PLACED IN BIT MODE.
                        * SOM IS SET TWICE TO SEND 2 FLAG CHARS. THEN, 2 000 CHARS ARE SENT, AND
                        * THEN 2 TERMINATING FLAGS ARE SENT.
                        * THE TRANSMITTER IS THEN DISABLED, USING OC, AND OACT IS MONITORED FOR THE
                        * CLEARED STATE.
                        ;*****************************************************************************
                        ;*****************************************************************************
                            TEST 25 - TX MSG TIMING TEST, CHAR MODE, WITH NO CRC
                        *
                        * IN THIS TEST, AN ENTIRE MESSAGE IS TRANSMITTED (USING STEPLU AND LULOOP)
                        * AND THE PROGRAM MONITORS THE OCCURRENCE OF USYRT TX BUFFER EMPTY FLAGS
                        * (BY SCANNING ORDY AND OCOR) AND OACT, AT EACH STEP. THE TEST IS DONE IN
                        * CHARACTER ORIENTED PROTOCOL MODE, USING 8-BIT CHARS AND NO ERROR CHECKING.
                        * THE FOLLOWING STEPS ARE DONE:
                        * A MASTER CLEAR IS DONE, AND THE LINE UNIT IS PLACED IN CHAR MODE.
                        * SOM IS SET TWICE TO SEND 2 SYNCH CHARS. THEN, 2 000 CHARS ARE SENT, AND
                        * THEN 2 TERMINATING SYNCHS ARE SENT.
                        * THE TEST IS PERFORMED WITH TXEN (REG 14, BIT6) SET, AND THE PROGRAM CHECKS
                        * THAT THIS HOLDS RTS HIGH PAST THE END OF THE MESSAGE.
                        * THE TRANSMITTER IS THEN DISABLED, USING OC, AND OACT IS MONITORED FOR THE
                        * CLEARED STATE.
                        ;*****************************************************************************
                        ;*****************************************************************************
```

```
                        TEST 26 - TX UNDERRUN SET AND CLEAR TEST - CHAR MODE
                *
                * IN THIS TEST, A TX UNDERRUN ERROR IS FORCED IN EACH OF 2 SITUATIONS,
                * AND THEN CLEARED DIFFERENTLY IN EACH.
                * IN THE FIRST, A MESSAGE IS INITIATED, A 000 CHAR IS SENT, AND THE TX
                * BUFFER IS NOT SERVICED IN RESPONSE TO THE USYRT TX BUFFER EMPTY FLAG,
                * WHICH CAUSES UNRR TO SET IN REG 11. THEN, SOM IS SET TO CLEAR THE ERROR,
                * AND THIS IS VERIFIED.
                * IN THE SECOND SITUATION, A MSG IS INITIATED, A 000 CHAR IS SENT, AND THE TX
                * BUFFER IS NOT SERVICED IN RESPONSE TO THE USYRT TX BUFFER EMPTY FLAG, WHICH
                * AGAIN CAUSES UNRR TO SET. THEN, A MASTER CLEAR IS DONE, AND THE UNRR BIT
                * IS CHECKED TO BE CLEARED.
                ;*****************************************************************************




                ;*****************************************************************************
                        TEST 27 - TRANSMIT CHAR LENGTH TIMING TEST - CHAR MODE, CRC
                *
                * THE LINE UNIT IS PLACED IN CHAR MODE (DDCMP) AND A MESSAGE IS INITIATED
                * WITH AN 8-BIT SYNCH AND A 5-BIT SYNCH CHAR. NEXT, A 000 CHAR IS SENT WITH
                * EACH OF THE FOLLOWING TX CHAR LENGTHS : 5 BITS, 6 BITS, 7 BITS, 8 BITS.
                * (FOR EXAMPLE, A 5-BIT CHAR REQUIRES 5 CLOCK CYCLES TO BE TRANSMITTED). TWO
                * TERMINATING SYNCHS ARE SENT AFTER THE DATA.
                ;*****************************************************************************




                ;*****************************************************************************
                        TEST 28 - TRANSMIT CHAR LENGTH TIMING TEST - BIT MODE, CRC
                *
                * THE LINE UNIT IS PLACED IN BIT MODE AND A MESSAGE IS INITIATED
                * WITH 2 FLAG CHARS. NEXT, 2 8-BIT 000 CHARS ARE SENT, FOLLOWED BY 000 CHARS
                * WITH EACH OF THE FOLLOWING TRANSMITTER CHAR LENGTHS:
                *     1 BIT, 2 BITS, 3 BITS, 4 BITS, 5 BITS, 6 BITS, 7 BITS, AND 8 BITS.
                * (FOR EXAMPLE, A 5-BIT CHAR REQUIRES 5 CLOCK CYCLES TO BE TRANSMITTED).
                * TWO TERMINATING FLAGS ARE SENT AFTER THE DATA.
                ;*****************************************************************************




                ;*****************************************************************************
                        TEST 29 - TXDATA BIT TEST - CHAR MODE, CRC
                *
                * THE LINE UNIT IS INITIALIZED AND A MSG IS INITIATED (USING STEPLU) WITH CRC-
                * 16 SELECTED IN CHAR MODE. TWO SYNCHS, 000,125,252,377,000, AND 2 TERMINATING
                * SYNCHS ARE THEN SENT. THE PROGRAM CHECKS EACH BIT OF THE TRANSMITTED
                * DATA CHARS, BY MONITORING TXDATA (REG 17) AS THE DATA IS CLOCKED OUT OF
                * THE USYRT TRANSMITTER.
                ;*****************************************************************************
```

```
                ;*****************************************************************************
                    TEST 30 - USYRT RECEIVER MSG TEST - CHAR MODE, CRC
                *
                * THE LINE UNIT IS INITIALIZED AND A MESSAGE IS INITIATED (USING STEPLU) WITH
                * LULP (REG 12) SET TO LOOP THE DATA INTERNALLY IN THE USYRT, AND WITH CRC-16
                * SELECTED. TWO SYNCHS, 000,125,252,377,000, AND FOUR TERMINATING SYNCHS ARE
                * SENT. THE PROGRAM MONITORS IACT, AND THE RCV'D CHARS AND CRC BYTES ARE READ
                * FROM AX0-15 AND COMPARED TO EXPECTED VALUES. THE PROGRAM THEN CHECKS FOR IACT
                *  STILL SET AFTER THE MESSAGE.
                ;*****************************************************************************




                ;*****************************************************************************
                    TEST 31 - USYRT RECEIVER MSG TEST - BIT MODE, CRC
                *
                * THE LINE UNIT IS INITIALIZED AND A MESSAGE IS INITIATED (USING STEPLU) WITH
                * LULP (REG 12) SET TO LOOP THE DATA INTERNALLY IN THE USYRT, AND WITH CRC-
                * CCITT-1. TWO FLAGS, 000,125,252,377,000, AND TWO TERMINATING FLAGS ARE THEN
                * SENT. THE PROGRAM MONITORS IACT, RSOM, AND THE RCV'D CHARS ARE READ
                * FROM AX0-15 AND COMPARED TO EXPECTED VALUES. THE PROGRAM THEN CHECKS FOR
                * IACT = 0, SETS IC TO CLEAR THE RECEIVER, AND CHECKS FOR IACT STILL = 0.
                ;*****************************************************************************




                ;*****************************************************************************
                    TEST 32 - USYRT RECEIVER MSG TEST - CHAR MODE, NO CRC
                *
                * THE LINE UNIT IS INITIALIZED AND A MESSAGE IS INITIATED (USING STEPLU) WITH
                * LULP (REG 12) SET TO LOOP THE DATA INTERNALLY IN THE USYRT, AND WITH NO
                * ERROR DETECTION. TWO SYNCHS, 000,125,252,377,000, AND TWO SYNCHS ARE
                * THEN SENT. THE PROGRAM MONITORS IACT, AND THE RECEIVED CHARS ARE READ FROM
                * AX0-15 AND COMPARED TO EXPECTED VALUES. THE PROGRAM THEN CHECKS FOR IACT
                * STILL = 0, SETS IC TO CLEAR THE RECEIVER, AND CHECKS FOR IACT = 0.
                ;*****************************************************************************




                ;*****************************************************************************
                    TEST 33 - USYRT RECEIVER MSG TEST - BIT MODE, NO CRC
                *
                * THE LINE UNIT IS INITIALIZED AND A MESSAGE IS INITIATED (USING STEPLU) WITH
                * LULP (REG 12) SET TO LOOP THE DATA INTERNALLY IN THE USYRT, AND WITH ERROR
                * DETECTION INHIBITED. TWO FLAGS, 000,125,252,377,000, AND TWO TERMINATING FLAGS
                * ARE THEN SENT. THE PROGRAM MONITORS IACT, RSOM, AND THE RCV'D CHARS ARE
                * READ FROM AX0-15 AND COMPARED TO EXPECTED VALUES. THE PROGRAM THEN CHECKS FOR
```

```
                        * IACT = 0, SETS IC TO CLEAR THE RECEIVER, AND CHECKS FOR IACT STILL = 0.
                        ;*****************************************************************************
                        ;*****************************************************************************
                            TEST 34 - SILO-DISABLED TRANSMITTER LOAD TEST
                        *
                        * THIS TEST DISABLES THE SILOS, LOADS A 125 CHARACTER INTO THE TX SILO, AND
                        * READS AX1-15 AND CHECKS THAT THE DATA DID NOT GET LOADED INTO THE USYRT TX
                        * BUFFER.
                        ;*****************************************************************************
                        ;*****************************************************************************
                            TEST 35 - SILO-DISABLED MESSAGE TEST - BIT MODE, NO CRC
                        *
                        * THE LINE UNIT IS INITIALIZED AND A MESSAGE IS INITIATED (USING STEPLU)
                        * WITH LULP (REG 12) SET TO LOOP THE DATA INTERNALLY IN THE USYRT, WITH SILO
                        * DISABLE SET, AND WITH NO ERROR DETECTION. TWO FLAGS, 000,125,252, AND
                        * TERMINATING FLAGS ARE THEN SENT BY LOADING THE TRANSMITTED CHARS INTO
                        * REG AX1. THE PROGRAM MONITORS OACT, IACT, RSOM, REOM, ORDY, OCOR, ICIR,
                        * IRDY, AND THE RECEIVED CHARS ARE READ FROM AX0 AND COMPARED TO EXPECTED
                        * VALUES.
                        ;*****************************************************************************
                        ;*****************************************************************************
                            TEST 36 - RECEIVER BUFFER TEST - CHAR MODE, CRC
                        *
                        * FIRST, A MASTER CLEAR IS DONE AND THE PROGRAM CHECKS FOR ICIR = 1 AND IRDY
                        * = 0. THEN, 2 SOM CHARS ARE LOADED AND CLOCKED INTO THE USYRT, AND 64
                        * BYTES OF A 256-BYTE BINARY COUNT DATA PATTERN (000-377) ARE LOADED INTO
                        * THE TX SILO.
                        * THE LINE UNIT IS THEN CLOCKED UNTIL IRDY = 1, AND THE PROGRAM CHECKS FOR
                        * THIS TO OCCUR WITHIN 40-43 CYCLES. THE PROGRAM READS THE RCV SILO, CHECKS THE
                        * CHAR FOR 000, AND CHECKS FOR IRDY = 0 AGAIN.
                        * THE LINE UNIT IS THEN CLOCKED IN GROUPS OF 8 CYCLES, AND AFTER EACH, THE
                        * PROGRAM CHECKS FOR ICIR = 1, IRDY = 1, UNTIL THE 64TH GROUP, AFTER WHICH
                        * IT CHECKS FOR ICIR = 0, IRDY = 1. THE SECOND DATA CHAR IS READ FROM THE
                        * RECEIVER SILO AND COMPARED TO 001. THEN, THE PROGRAM CHECKS FOR ICIR = 1,
                        * IRDY = 1 AGAIN.
                        * THE REST OF THE BINARY COUNT DATA BYTES ARE CYCLED 8 CLOCKS AND READ AND
                        * COMPARED A BYTE AT A TIME.
                        ;*****************************************************************************
```

```
                        ;*****************************************************************************
                            TEST 37 - RECEIVER CHAR LENGTH TIMING TEST - CHAR MODE, NO CRC
                        *
                        * THE LINE UNIT IS PLACED IN CHAR MODE, WITH NO ERROR DETECTION, AND A MSG IS
                        * INITIATED WITH 2 SYNCH CHARS. NEXT, FIFTEEN 000 CHARS ARE LOADED INTO THE
                        * TRANSMITTER SILO. THE LINE UNIT IS THEN CLOCKED USING STEPLU WITH LULOOP
                        * SET, WHILE THE RECEIVER CHAR LENGTH IS SET TO THE FOLLOWING VALUES : 5,6,7,8.
                        * FOR EACH RCV CHAR LENGTH, THE PROGRAM CHECKS TO MAKE SURE THET USYRT RECEIVER
                        * FLAGS OCCUR THE PROPER NO. OF CYCLES APART, FOR EACH RCV CHAR LENGTH.
                        * (FOR EXAMPLE A 5-BIT CHAR TAKES 5 CLOCK CYCLES TO BE RECEIVED). A MASTER
                        * CLEAR IS THEN DONE TO TERMINATE THE OPERATION.
                        ;*****************************************************************************



                        ;*****************************************************************************
                            TEST 38 - RECEIVER CHAR LENGTH TIMING TEST - BIT MODE, NO CRC
                        *
                        * THE LINE UNIT IS PLACED IN BIT MODE WITH NO ERROR DETECTION, AND A MESSAGE IS
                        * INITIATED  WITH 2 FLAG CHARS. NEXT, FIFTEEN 000 CHARS ARE LOADED INTO THE
                        * TRANSMITTER SILO. THE LINE UNIT IS THEN CLOCKED USING STEPLU WITH LULOOP
                        * SET, WHILE THE RCV CHAR LENGTH IS SET TO THE FOLLOWING VALUES : 8,8,8,7,6,5,
                        * 4,3,2,1. FOR EACH RCV CHAR LENGTH, THE PROGRAM CHECKS TO MAKE SURE THAT THE
                        * USYRT RECEIVER FLAGS OCCUR THE PROPER NO. OF CYCLES APART, FOR EACH RCV
                        * CHAR LENGTH. (FOR EXAMPLE, A 5 BIT CHAR TAKES 5 CLOCK CYCLES TO BE RECEIVED).
                        * A MASTER CLEAR IS THEN DONE TO TERMINATE THE OPERATION.
                        ;*****************************************************************************



                        ;*****************************************************************************
                            TEST 39 - TRANSMITTER UNDERRUN ERROR, IDLE MARKING, CHAR MODE,NO CRC

                        * THE LINE UNIT IS PLACED IN CHAR MODE, AND THE IDLE BIT IS SET. THEN, A
                        * MSG IS INITIATED, A 000 CHAR IS SENT, AND THE TX BUFFER IS NOT SERVICED
                        * IN RESPONSE TO THE USYRT TX BUFFER EMPTY FLAG, WHICH CAUSES A TX UNDERRUN
                        * ERROR. THEN, THE RECEIVER IS CLOCKED AND CHECKED FOR TWO 377 CHARS TO BE
                        * RECEIVED (LINE MARKING) BEFORE SHUTTING DOWN WITH A MASTER CLEAR.
                        ;*****************************************************************************



                        ;*****************************************************************************
                            TEST 40 - MSG TERMINATION WITH GA CHARS - BIT MODE,NO CRC
                        *
                        * THE DEVICE IS ENABLED FOR TRANSMIT AND RECEIVE, AND A MESSAGE IS
                        * INITIATED IN BIT MODE.
                        * 2 FLAG CHARACTERS ARE SENT, FOLLOWED BY
                        * THE FOLLOWING DATA CHARACTERS : 000, 125, 252, 377, 000. THEN THE LOOP
                        * MODE BIT (STRIP) IS SET AND 2 TERMINATING GO-AHEAD CHARACTERS ARE
```

```
                        * SENT. EACH USYRT RCV FLAG IS TIMED AS IT IS RECEIVED, AND THE 5 DATA
                        * WORDS ARE READ AND COMPARED TO EXPECTED VALUES.
                        * ALSO, THE FIRST GA CHAR IS CHECKED BY SCANNING THE TXDATA BIT AS THE GA
                        * IS BEING TRANSMITTED (GA = 376 OCTAL).
                        * THE TEST ALSO CHECKS FOR SETTING OF RAB AND EBLK
                        * IN LOOP MODE.
                        ;*************************************************************************
                        ;*************************************************************************
                        *    TEST 41 - IDLE SYNCHS TEST - CHAR MODE
                        *
                        * THE DEVICE IS ENABLED FOR TRANSMIT AND RECEIVE, AND A MESSAGE IS
                        * INITIATED IN CHAR MODE. 24(DEC) SYNCHS ARE SENT.
                        * EACH SYNCH IS TIMED AS IT IS RECEIVED, AND THE BITS ARE CHECKED
                        * FOR A VALID SYNCH CHAR FOR EACH OF THE 22 SYNCHS WHICH FOLLOW
                        * THE FIRST TWO (THESE PERFORM SYNCHRONIZATION, AND ARE NOT READ).
                        * WHILE THE LAST SYNCH IS BEING TRANSMITTED, OC IS SET, AND THE
                        * NEXT CHAR RCV'D AFTER THE SYNCH IS CHECKED TO BE 377 (LINE MARKING).
                        * THEN, A MASTER CLEAR IS ISSUED.
                        * THE SYNCH CHAR USED IS 226 (OCTAL).
                        ;*************************************************************************
                        ;*************************************************************************
                        *    TEST 42 - STRIP SYNCH TEST
                        *
                        * THE DEVICE IS ENABLED FOR TRANSMIT AND RECEIVE, AND A MESSAGE IS
                        * INITIATED IN CHAR MODE AND WITH THE STRIP SYNCH
                        * BIT SET. THEN 24 (DEC) SYNCHS ARE SENT
                        * FOLLOWED BY THE FOLLOWING DATA CHARACTERS : 377, 000, 125, 252,
                        * AND THEN 2 TERMINATING SYNCHS.
                        * EACH OF THE 23 SYNCHS AFTER THE FIRST ARE CHECKED AT THE TRANSMITTER OUTPUT,
                        * BY SCANNING THE TXDATA BIT.
                        * EACH USYRT RCV FLAG IS TIMED AS IT IS RECEIVED, AND THE 4 DATA WORDS
                        * ARE READ AND COMPARED TO EXPECTED VALUES.
                        * FINALLY, THE LINE UNIT IS CLOCKED FOR SEVERAL CHAR TIMES, AND A CHECK
                        * IS MADE FOR OACT = 0 (TEOM SHOULD CAUSE TX ENABLE TO DROP).
                        * THE ABOVE TEST IS REPEATED FOR EACH OF THE FOLLOWING SYNCH CHAR DATA
                        * PATTERNS : 226,000,125,252,376,177.
                        ;*************************************************************************


                        8.1 DATA PATTERNS USED


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

```
                                PATA:
                                        .BYTE   125
                                        .BYTE   252
                                        .BYTE   000
                                        .BYTE   377
                                        .BYTE   001
                                        .BYTE   002
                                        .BYTE   004
                                        .BYTE   010
                                        .BYTE   020
                                        .BYTE   040
                                        .BYTE   100
                                        .BYTE   200
                                        .BYTE   376
                                        .BYTE   375
                                        .BYTE   373
                                        .BYTE   367
                                        .BYTE   357
                                        .BYTE   337
                                        .BYTE   277
                                        .BYTE   177

                                ***** DATA PATTERN B *****
                                PATB:
                                        .BYTE   000
                                        .BYTE   000
                                        .BYTE   040
                                        .BYTE   100
                                        .BYTE   220
                                        .BYTE   000
                                        .BYTE   000
                                        .BYTE   051

                                ***** DATA PATTERN C *****
                                PATC:
                                        .BYTE   020
                                        .BYTE   020
                                        .BYTE   020

                                ***** DATA PATTERN D *****
                                PATD:
                                        .BYTE   000
                                        .BYTE   040
                                        .BYTE   000

                                ***** DATA PATTERN E *****
                                PATE:
                                        .BYTE   000
                                        .BYTE   120
                                        .BYTE   020
                                        .BYTE   100
                                        .BYTE   120
                                        .BYTE   000

                                ***** DATA PATTERN F *****
                                PATF:
                                        .BYTE   050
```

```
                                        .BYTE   051
                                        .BYTE   050

                                ***** DATA PATTERN G *****
                                PATG:
                                        .BYTE   000
                                        .BYTE   000
                                        .BYTE   240
                                        .BYTE   120
                                        .BYTE   177
                                        .BYTE   000
                                        .BYTE   000
                                        .BYTE   001

                                ***** DATA PATTERN H *****
                                PATH:
                                        .BYTE   000
                                        .BYTE   000
                                        .BYTE   377
                                        .BYTE   017
                                        .BYTE   377
                                        .BYTE   377
                                        .BYTE   375
                                        .BYTE   377

                                ***** DATA PATTERN I *****
                                PATI:
                                        .BYTE   000
                                        .BYTE   000
                                        .BYTE   000
                                        .BYTE   000
                                        .BYTE   000
                                        .BYTE   103
                                        .BYTE   000
                                        .BYTE   000

                                ***** DATA PATTERN J *****
                                PATJ:
                                        .BYTE   000
                                        .BYTE   000
                                        .BYTE   010
                                        .BYTE   002
                                        .BYTE   004
                                        .BYTE   103
                                        .BYTE   001
                                        .BYTE   100

                                ***** DATA PATTERN K *****
                                PATK:   .BYTE   000
                                        .BYTE   000
                                        .BYTE   377
                                        .BYTE   377
                                        .BYTE   125
                                        .BYTE   125
                                        .BYTE   252
                                        .BYTE   252
                                        .BYTE   001
```

```
    799                                 .BYTE   000
    800                                 .BYTE   002
    801                                 .BYTE   000
    802                                 .BYTE   004
    803                                 .BYTE   000
    804                                 .BYTE   010
    805                                 .BYTE   000
    806                                 .BYTE   020
    807                                 .BYTE   000
    808                                 .BYTE   040
    809                                 .BYTE   000
    810                                 .BYTE   100
    811                                 .BYTE   000
    812                                 .BYTE   200
    813                                 .BYTE   000
    814                                 .BYTE   000
    815                                 .BYTE   001
    816                                 .BYTE   000
    817                                 .BYTE   002
    818                                 .BYTE   000
    819                                 .BYTE   004
    820                                 .BYTE   000
    821                                 .BYTE   010
    822                                 .BYTE   000
    823                                 .BYTE   020
    824                                 .BYTE   000
    825                                 .BYTE   040
    826                                 .BYTE   000
    827                                 .BYTE   100
    828                                 .BYTE   000
    829                                 .BYTE   200
    830                                 .BYTE   376
    831                                 .BYTE   377
    832                                 .BYTE   375
    833                                 .BYTE   377
    834                                 .BYTE   373
    835                                 .BYTE   377
    836                                 .BYTE   367
    837                                 .BYTE   377
    838                                 .BYTE   357
    839                                 .BYTE   377
    840                                 .BYTE   337
    841                                 .BYTE   377
    842                                 .BYTE   277
    843                                 .BYTE   377
    844                                 .BYTE   177
    845                                 .BYTE   377
    846                                 .BYTE   377
    847                                 .BYTE   376
    848                                 .BYTE   377
    849                                 .BYTE   375
    850                                 .BYTE   377
    851                                 .BYTE   373
    852                                 .BYTE   377
    853                                 .BYTE   367
    854                                 .BYTE   377
    855                                 .BYTE   357
```

```
                        .BYTE   377
                        .BYTE   337
                        .BYTE   377
                        .BYTE   277
                        .BYTE   377
                        .BYTE   177

                ***** DATA PATTERN L *****
                PATL:
                        .BYTE   000
                        .BYTE   000
                        .BYTE   377
                        .BYTE   377
                        .BYTE   000
                        .BYTE   000

                ***** DATA PATTERN M *****
                PATM:
                        .BYTE   000
                        .BYTE   020
                        .BYTE   000
                        .BYTE   000
                        .BYTE   200
                        .BYTE   000
                        .BYTE   000
                        .BYTE   051

                ***** DATA PATTERN N *****
                PATN:
                        .BYTE   000
                        .BYTE   000
                        .BYTE   000
                        .BYTE   125
                        .BYTE   000
                        .BYTE   252
                        .BYTE   000
                        .BYTE   377
                        .BYTE   005
                        .BYTE   000
                        .BYTE   012
                        .BYTE   000
                        .BYTE   017
                        .BYTE   000

                ***** DATA PATTERN O *****
                PATO:
                        .BYTE   000
                        .BYTE   041
                        .BYTE   004
                        .BYTE   010
                        .BYTE   020
                        .BYTE   040
                        .BYTE   100
                        .BYTE   101
                        .BYTE   200
                        .BYTE   201
                        .BYTE   300
```

```
                                .BYTE   111
                                .BYTE   301
                                .BYTE   375

                        ***** DATA PATTERN P *****
                        PATP:
                                .BYTE   000
                                .BYTE   113
                                .BYTE   200
                                .BYTE   040
                                .BYTE   020
                                .BYTE   010
                                .BYTE   001
                                .BYTE   104
                                .BYTE   007
                                .BYTE   105
                                .BYTE   007
                                .BYTE   144
                                .BYTE   107
                                .BYTE   157

                        ***** DATA PATTERN U *****
                        PATU:   .BYTE   000
                                .BYTE   000
                                .BYTE   001
                                .BYTE   000
                                .BYTE   013
                                .BYTE   000
                                .BYTE   011
                                .BYTE   000
                                .BYTE   021
                                .BYTE   000
                                .BYTE   101
                                .BYTE   000
                                .BYTE   301
                                .BYTE   000
                                .BYTE   000
                                .BYTE   001
                                .BYTE   000
                                .BYTE   002
                                .BYTE   000
                                .BYTE   004
                                .BYTE   000
                                .BYTE   040
                                .BYTE   000
                                .BYTE   100
                                .BYTE   000
                                .BYTE   200
                                .BYTE   000
                                .BYTE   346
                                .BYTE   000
                                .BYTE   345
                                .BYTE   000
                                .BYTE   343
                                .BYTE   000
                                .BYTE   307
                                .BYTE   000
```

```
                                .BYTE   247
                                .BYTE   000
                                .BYTE   147

                        ***** DATA PATTERN V *****
                        PATV:   .BYTE   000
                                .BYTE   000
                                .BYTE   333
                                .BYTE   000
                                .BYTE   331
                                .BYTE   000
                                .BYTE   323
                                .BYTE   000
                                .BYTE   313
                                .BYTE   000
                                .BYTE   233
                                .BYTE   000
                                .BYTE   133
                                .BYTE   000
                                .BYTE   000
                                .BYTE   001
                                .BYTE   000
                                .BYTE   002
                                .BYTE   000
                                .BYTE   004
                                .BYTE   000
                                .BYTE   040
                                .BYTE   000
                                .BYTE   100
                                .BYTE   000
                                .BYTE   200
                                .BYTE   000
                                .BYTE   346
                                .BYTE   000
                                .BYTE   345
                                .BYTE   000
                                .BYTE   343
                                .BYTE   000
                                .BYTE   307
                                .BYTE   000
                                .BYTE   247
                                .BYTE   000
                                .BYTE   147
```

9.0 ERROR INFORMATION

9.1 ERROR REPORTING

EPRORS 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 AN "IRDY NOT SET" ERROR, AND PROVIDES THE PC OF THE ERROR CALL AND THE PC OF THE CALL TO THE SUBROUTINE REPORTING IT, THE FAILING REGISTER NAME, AND DEVICE REGISTER CONTENTS :

```
  CZDMR DVC FTL ERR 00017 ON UNIT 00 TST 034 SUB 000 PC:  006210
  IRDY NOT SET
  PC OF SUBR CALL:  030044
  DEVICE CSR ADDRESS : 160170

  FAILING REG:  INBUS/OUTBUS REG 12

  LINE UNIT INBUS REGS:
  REG10   REG11   REG12   REG13
  000     120     000     257
      REG14   REG15   REG16   REG17
      024     377     377     035

  LINE UNIT EXTENDED REGS:
  AX0-15  AX0-16  AX1-15  AX1-16
  000     000     000     000
      AX2-15  AX2-16  AX3-15  AX3-16
      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 :

```
  CZDMR DVC FTL ERR 00017 ON UNIT 00 TST 034 SUB 000 PC:006210
  IRDY NOT SET
  PC OF SUBR CALL:  030044
  DEVICE CSR ADDRESS : 160170

  FAILING REG:  INBUS/OUTBUS REG 12
```

PROGRAM DOCUMENT

```
58
59
60                              @
61
62
63
64
65
```

```
                        .TITLE CZDMRD M8203 STATIC DIAG #1
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

                                ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
                                ;       IF ANY OPTIONAL POINTERS ARE TO BE USED IN THE "HEADER", CHANGE
                                ;       "POINTER" TO CONTAIN THE CORRECT ARGUMENTS.  IF ALL OPTIONAL
                                ;       POINTERS ARE TO BE USED, CHANGE "POINTER" TO BE "POINTER ALL".
                                ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

002000                                  HEADER  CZDMR,D,0,45.,0
002000                                                                  L$NAME::
002000     103                                                                  .ASCII /C/
002001     132                                                                  .ASCII /Z/
002002     104                                                                  .ASCII /D/
002003     115                                                                  .ASCII /M/
002004     122                                                                  .ASCII /R/
002005     000                                                                  .BYTE   0
002006     000                                                                  .BYTE   0
002007     000                                                                  .BYTE   0
002010                                                                  L$REV::
002010     104                                                                  .ASCII  /D/
002011                                                                  L$DEPO::
002011     060                                                                  .ASCII  /0/
002012                                                                  L$UNIT::
002012  000000                                                                  .WORD   0
002014                                                                  L$TIML::
002014  000055                                                                  .WORD   45.
002016                                                                  L$HPCP::
002016  035554                                                                  .WORD   L$HARD
002020                                                                  L$SPCP::
002020  000000                                                                  .WORD   0
002022                                                                  L$HPTP::
002022  002252                                                                  .WORD   L$HW
002024                                                                  L$SPTP::
002024  000000                                                                  .WORD   0
002026                                                                  L$LADP::
002026  036234                                                                  .WORD   L$LAST
002030                                                                  L$STA::
002030  000000                                                                  .WORD   0
002032                                                                  L$CO::
002032  000000                                                                  .WORD   0
002034                                                                  L$DTYP::
002034  000000                                                                  .WORD   0
002036                                                                  L$APT::
002036  000000                                                                  .WORD   0
002040                                                                  L$DTP::
002040  002124                                                                  .WORD   L$DISPATCH
002042                                                                  L$PRIO::
002042  000000                                                                  .WORD   0
002044                                                                  L$ENVI::
002044  000000                                                                  .WORD   0
002046                                                                  L$EXP1::
```

PROGRAM HEADER

```
002046  000000                                          .WORD   0
002050                                          L$MREV::
002050     003                                          .BYTE   C$REVISION
002051     003                                          .BYTE   C$EDIT
002052                                          L$EF::
002052  000000                                          .WORD   0
002054  000000                                          .WORD   0
002056                                          L$SPC::
002056  000000                                          .WORD   0
002060                                          L$DEVP::
002060  003462                                          .WORD   L$DVTYP
002062                                          L$REPP::
002062  000000                                          .WORD   0
002064                                          L$EXP4::
002064  000000                                          .WORD   0
002066                                          L$EXP5::
002066  000000                                          .WORD   0
002070                                          L$AUT::
002070  021632                                          .WORD   L$AU
002072                                          L$DUT::
002072  021550                                          .WORD   L$DU
002074                                          L$LUN::
002074  000000                                          .WORD   0
002076                                          L$DESP::
002076  003470                                          .WORD   L$DESC
002100                                          L$LOAD::
002100  104035                                          EMT     E$LOAD
002102                                          L$ETP::
002102  000000                                          .WORD   0
002104                                          L$ICP::
002104  021116                                          .WORD   L$INIT
002106                                          L$CCP::
002106  021546                                          .WORD   L$CLEAN
002110                                          L$ACP::
002110  021466                                          .WORD   L$AUTO
002112                                          L$PRT::
002112  021110                                          .WORD   L$PROT
002114                                          L$TEST::
002114  000000                                          .WORD   0
002116                                          L$DLY::
002116  000000                                          .WORD   0
002120                                          L$HIME::
002120  000000                                          .WORD   0
18
20                      ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
21                      ;       CHANGE THE "HEADER" TO CONTAIN THE PROPER ARGUMENTS.
22                      ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
24
25                      .EVEN
26
27
28
29
30
31
```

DISPATCH TABLE

```
                        .SBTTL  DISPATCH TABLE

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

002122                          DISPATCH 42
002122  000052                                                          .WORD   42
002124                                                          L$DISPATCH::
002124  021634                                                          .WORD   T1
002126  021716                                                          .WORD   T2
002130  022002                                                          .WORD   T3
002132  022126                                                          .WORD   T4
002134  022230                                                          .WORD   T5
002136  022356                                                          .WORD   T6
002140  022476                                                          .WORD   T7
002142  022652                                                          .WORD   T8
002144  023106                                                          .WORD   T9
002146  023224                                                          .WORD   T10
002150  023342                                                          .WORD   T11
002152  023460                                                          .WORD   T12
002154  023576                                                          .WORD   T13
002156  024226                                                          .WORD   T14
002160  024560                                                          .WORD   T15
002162  025050                                                          .WORD   T16
002164  025260                                                          .WORD   T17
002166  025464                                                          .WORD   T18
002170  025670                                                          .WORD   T19
002172  026126                                                          .WORD   T20
002174  026360                                                          .WORD   T21
002176  026632                                                          .WORD   T22
002200  027310                                                          .WORD   T23
002202  027430                                                          .WORD   T24
002204  027540                                                          .WORD   T25
002206  027734                                                          .WORD   T26
002210  030300                                                          .WORD   T27
002212  030510                                                          .WORD   T28
002214  031040                                                          .WORD   T29
002216  031140                                                          .WORD   T30
002220  031510                                                          .WORD   T31
002222  032052                                                          .WORD   T32
002224  032322                                                          .WORD   T33
002226  032664                                                          .WORD   T34
002230  033014                                                          .WORD   T35
002232  033726                                                          .WORD   T36
002234  034210                                                          .WORD   T37
002236  034410                                                          .WORD   T38
002240  034710                                                          .WORD   T39
002242  035000                                                          .WORD   T40
002244  035142                                                          .WORD   T41
002246  035310                                                          .WORD   T42

                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                        ;       CHANGE THE ARGUMENT OF "DISPATCH" TO BE THE
                        ;       NUMBER OF HARDWARE TESTS IN YOUR PROGRAM.
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
```

DISPATCH TABLE

```
16
17
18
19
20
```

```
                        .SBTTL  DEFAULT HARDWARE P-TABLE

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

002250                          BGNHW   DFPTBL
002250  000013                                                         .WORD   L10000-L$HW/2
002252                                                                L$HW::
002252                                                                DFPTBL::

002252  000007                  .WORD       7         ;MICROPROCESSOR TYPE = M8207
002254  160170                  .WORD  160170         ;M8207 CSR UNIBUS ADDRESS
002256  000300                  .WORD     300         ;M8207 INTERRUPT VECTOR
002260  005000                  .WORD    5000         ;M8207 INTERRUPT PRIORITY LEVEL = 5
002262  000003                  .WORD       3         ;LINE UNIT = M8203
002264  000000                  .WORD     000         ;M8203 REG 11 (E121 SW10,9 , E134 SW9,10)
002266  000000                  .WORD     000         ;M8203 REG 15 (E134 SW1-8)
002270  000000                  .WORD     000         ;M8203 REG 16 (E121 SW1-8)
002272  000000                  .WORD       0         ;H3254&H3255 USED
002274  000004                  .WORD       4         ;BAUD RATE = 56 K
002276  000001                  .WORD       1         ;M8207 RUN SWITCH (E28 SW7) IS ON

002300                          ENDHW
002300                                                                L10000:
```

SOFTWARE P-TABLE

```
                        .SBTTL  SOFTWARE P-TABLE

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

002300                          BGNSW   SFPTBL
002300  000000                                                          .WORD   L10001-L$SW/2
002302                                                                  L$SW::
002302                                                                  SFPTBL::

                        ENDSW
002302                                                                  L10001:
```

```
                        .SBTTL  GLOBAL EQUATES SECTION


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

002302                          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
000140                  PRI03== 140
000100                  PRI02== 100
000040                  PRI01== 40
000000                  PRI00== 0
                        ;
                        ;OPERATOR FLAG BITS
                        ;
000004                  EVL==     4
000010                  LOT==    10
000020                  ADR==    20
000040                  IDU==    40
000100                  ISR==   100
000200                  UAM==   200
000400                  BOE==   400
001000                  PNT==  1000
002000                  PRI==  2000
004000                  IXE==  4000
010000                  IBE== 10000
020000                  IER== 20000
040000                  LOE== 40000
100000                  HOE==100000
21
22
23
24
25                      ;;*****************************************************************************
26                      ;* PROGRAM EVENT FLAG DEFINITIONS
27                      ;;*****************************************************************************
28
29
30
31
32
33                      ;;*****************************************************************************
34                      ;* MAINTENANCE REGISTER - BSEL1
35                      ;;*****************************************************************************
36      000200          RUN     = BIT7
37      000100          MCLR    = BIT6
38      000020          STEPLU  = BIT4
39      000010          LULOOP  = BIT3
40      000004          ROMO    = BIT2
41      000002          ROMI    = BIT1
42      000001          STEPMP  = BIT0
43
44                      ;;*****************************************************************************
45                      ;* OBUS REG 10 - TRANSMITTER BUFFER
46                      ;;*****************************************************************************
```

```
                        TX7     = BIT7
000100                  TX6     = BIT6
000040                  TX5     = BIT5
000020                  TX4     = BIT4
000010                  TX3     = BIT3
000004                  TX2     = BIT2
000002                  TX1     = BIT1
000001                  TX0     = BIT0

                        ;;*************************************************************************
                        ;* OBUS REG 11
                        ;;*************************************************************************
000200                  OC      = BIT7
000010                  GOAH    = BIT3
000004                  ABORT   = BIT2
000002                  EOM     = BIT1
000001                  SOM     = BIT0

                        ;;*************************************************************************
                        ;* OBUS REG 12
                        ;;*************************************************************************
000200                  IC      = BIT7
000100                  BPOLL   = BIT6
000040                  LULP    = BIT5

                        ;;*************************************************************************
                        ;* OBUS REG 13
                        ;;*************************************************************************
000200                  POLL    = BIT7
000100                  DTR     = BIT6
000040                  SELFR   = BIT5
000020                  HDX     = BIT4
000010                  MAINT1  = BIT3
000004                  MAINT2  = BIT2
000002                  SELSBY  = BIT1

                        ;;*************************************************************************
                        ;* OBUS REG 14
                        ;;*************************************************************************
000100                  TXEN    = BIT6
000040                  DISSI   = BIT5
000020                  RDAX    = BIT4
000010                  WAX     = BIT3
000004                  ENAX    = BIT2
000002                  AX2     = BIT1
000001                  AX1     = BIT0

                        ;;*************************************************************************
                        ;* OBUS REG 17
                        ;;*************************************************************************
000200                  CRC2    = BIT7
000100                  CRC1    = BIT6
000040                  IDLE    = BIT5
000020                  SECA    = BIT4
000010                  STRIP   = BIT3
000004                  RDALL   = BIT2
000002                  IERR    = BIT1
```

```
                        DDCMP   = BIT0

                        ;;*****************************************************************************
                        ;* IBUS REG 10 - RECEIVER BUFFER
                        ;;*****************************************************************************
                        ;;
000200                  RX7     = BIT7
000100                  RX6     = BIT6
000040                  RX5     = BIT5
000020                  RX4     = BIT4
000010                  RX3     = BIT3
000004                  RX2     = BIT2
000002                  RX1     = BIT1
000001                  RX0     = BIT0

                        ;;*****************************************************************************
                        ;* IBUS REG 11
                        ;;*****************************************************************************
000200                  OC      = BIT7
000100                  OACT    = BIT6
000040                  SW3     = BIT5
000020                  ORDY    = BIT4
000010                  SW2     = BIT3
000004                  SW1     = BIT2
000002                  SW0     = BIT1
000001                  UNRR    = BIT0

                        ;;*****************************************************************************
                        ;* IBUS REG 12
                        ;;*****************************************************************************
000200                  IC      = BIT7
000100                  IACT    = BIT6
000040                  LULP    = BIT5
000020                  IRDY    = BIT4
000010                  OVRR    = BIT3
000004                  RAB     = BIT2
000002                  EBLK    = BIT1
000001                  BCC     = BIT0

                        ;;*****************************************************************************
                        ;* IBUS REG 13
                        ;;*****************************************************************************
000200                  RING    = BIT7
000100                  DTR     = BIT6
000040                  RTS     = BIT5
000020                  HDX     = BIT4
000010                  MODR    = BIT3
000004                  CS      = BIT2
000002                  STBY    = BIT1
000001                  CARR    = BIT0

                        ;;*****************************************************************************
                        ;* IBUS REG 14
                        ;;*****************************************************************************
000200                  READY   = BIT7
000100                  TXEN    = BIT6
000040                  DISSI   = BIT5
000020                  RDAX    = BIT4
```

```
                                WAX     = BIT3
                                ENAX    = BIT2
                                AX2     = BIT1
                                AX1     = BIT0

                                ;;*************************************************************************
                                ;* IBUS REG 17
                                ;;*************************************************************************
                                SIGR    = BIT7
                                SIGQ    = BIT6
                                TXDATA  = BIT5
                                COOR    = BIT4
                                ICIR    = BIT3
                                TESTMD  = BIT2
                                MCLK    = BIT1
                                DDCMP   = BIT0

                                ;;*************************************************************************
                                ;* AX0-15 - USYRT REG 0 (READ ONLY)
                                ;;*************************************************************************
                                RX7     = BIT7
                                RX6     = BIT6
                                RX5     = BIT5
                                RX4     = BIT4
                                RX3     = BIT3
                                RX2     = BIT2
                                RX1     = BIT1
                                RX0     = BIT0

                                ;;*************************************************************************
                                ;* AX0-16 - USYRT REG 1 (READ ONLY)
                                ;;*************************************************************************
                                RERR    = BIT7
                                ASBC2   = BIT6
                                ASBC1   = BIT5
                                ASBC0   = BIT4
                                ROR     = BIT3
                                RABT    = BIT2
                                REOM    = BIT1
                                RSOM    = BIT0

                                ;;*************************************************************************
                                ;* AX1-15 - USYRT REG 2
                                ;;*************************************************************************
                                TX7     = BIT7
                                TX6     = BIT6
                                TX5     = BIT5
                                TX4     = BIT4
                                TX3     = BIT3
                                TX2     = BIT2
                                TX1     = BIT1
                                TX0     = BIT0

                                ;;*************************************************************************
                                ;* AX1-16 - USYRT REG 3
                                ;;*************************************************************************
                                TERR    = BIT7
```

```
                                ;;*****************************************************************************
                                ;* AX2-15 - USYRT REG 4
                                ;;*****************************************************************************
000200                  SYN7    = BIT7
000100                  SYN6    = BIT6
000040                  SYN5    = BIT5
000020                  SYN4    = BIT4
000010                  SYN3    = BIT3
000004                  SYN2    = BIT2
000002                  SYN1    = BIT1
000001                  SYN0    = BIT0
000226                  SYNCH   = 226

                                ;;*****************************************************************************
                                ;* AX2-16 - USYRT REG 5
                                ;;*****************************************************************************
000200                  APA     = BIT7
000100                  DDC     = BIT6
000040                  STR     = BIT5
000020                  SEC     = BIT4
000010                  IDL     = BIT3
000004                  CRCTY2  = BIT2
000002                  CRCTY1  = BIT1
000001                  CRCTY0  = BIT0

                                ;;*****************************************************************************
                                ;* AX3-15 - USYRT REG 6
                                ;;*****************************************************************************
000200                  I422    = BIT7
000100                  XYZ     = BIT6
000040                  C32BCC  = BIT5
000020                  V35     = BIT4
000010                  INTGRL  = BIT3
000004                  C32ENB  = BIT2
000002                  OP      = BIT1
000001                  TEST    = BIT0
000372                  AX315U  = I422!XYZ!C32BCC!V35!INTGRL!OP

                                ;;*****************************************************************************
                                ;* AX3-16 - USYRT REG 7
                                ;;*****************************************************************************
000200                  TXLEN2  = BIT7
000100                  TXLEN1  = BIT6
000040                  TXLEN0  = BIT5
000004                  RXLEN2  = BIT2
000002                  RXLEN1  = BIT1
000001                  RXLEN0  = BIT0
```

```
                        ;*****************************************************************************
                        ;* TX CONTROL BITS DEFINED ON WORD BASIS
                        ;*****************************************************************************
004000                  TXGOA   = BIT11
002000                  TXABT   = BIT10
001000                  TXEOM   = BIT9
000400                  TXSOM   = BIT8




                        ;*************************************************************
                        ;* RCV CONTROL BITS DEFINED ON WORD BASIS
                        ;*************************************************************
004000                  RXOVR   = BIT11
002000                  RXABT   = BIT10
001000                  RXEBL   = BIT9
000400                  RXBCC   = BIT8




                        ;*****************************************************************************
                        ;* ADDRESS EQUATES FOR REGISTER STORAGE TABLE (LUREG:)
                        ;*****************************************************************************
002302                  LUR10   = LUREG+0       ;LINE UNIT IBUS REG 10
002304                  LUR11   = LUREG+2       ;LINE UNIT IBUS REG 11
002306                  LUR12   = LUREG+4       ;LINE UNIT IBUS REG 12
002310                  LUR13   = LUREG+6       ;LINE UNIT IBUS REG 13
002312                  LUR14   = LUREG+10      ;LINE UNIT IBUS REG 14
002314                  LUR15   = LUREG+12      ;LINE UNIT IBUS REG 15
002316                  LUR16   = LUREG+14      ;LINE UNIT IBUS REG 16
002320                  LUR17   = LUREG+16      ;LINE UNIT IBUS REG 17
002322                  AX0.15  = LUREG+20      ;USYRT REG 0
002324                  AX0.16  = LUREG+22      ;USYRT REG 1
002326                  AX1.15  = LUREG+24      ;USYRT REG 2
002330                  AX1.16  = LUREG+26      ;USYRT REG 3
002332                  AX2.15  = LUREG+30      ;USYRT REG 4
002334                  AX2.16  = LUREG+32      ;USYRT REG 5
002336                  AX3.15  = LUREG+34      ;USYRT REG 6
002340                  AX3.16  = LUREG+36      ;USYRT REG 7




100000                  CHPCHK  = BIT15

100000                  BCCCHK  = BIT15
100000                  CRCCHK  = BIT15




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

```
                                ;* MICROINSTRUCTION DEFINITIONS
                                ;*************************************************************************
000000          MVIOX   = 021000                ;MOVE IBUS TO OBUS*
000000          MVIXO   = 122000                ;MOVE IBUS* TO OBUS
000000          MVIXOX  = 121000                ;MOVE IBUS* TO OBUS*


                                ;***** ERROR1 BIT FLAG DEFINITIONS *****
000001          RRDYTO  = BIT0
000002          WRDYTO  = BIT1
```

```
                                .SBTTL  GLOBAL DATA SECTION

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

                                ;;**************************************************************************
                                ;* STORAGE FOR DEVICE REGISTERS
                                ;;**************************************************************************
002302                          LUREG:  .BLKW   16.

                                ;**************************************************************************
                                ;* MISCELLANEOUS STORAGE
                                ;**************************************************************************
002342  000000                  SCRACH: .WORD   0               ;GEN'L PURPOSE SCRATCH WORD
002344  000000                  LOGDEV: .WORD   0               ;LOGICAL DEVICE NUMBER
002346  000000                  PSTACK: .WORD   0               ;CONTAINS BASE LEVEL PROGRAM STACK POINTER
002350  000000                  PRIOR:  .WORD   0               ;CPU PRIORITY FOR PRINTOUT
002352  000000                  SUBRPC: .WORD   0               ;PC OF SUBR CALL FOR ERROR REPORTS
002354  000000                  INTFLG: .WORD   0               ;INTERRUPT RECEIVED FLAGS
                                                                ;  BIT 0 FOR TX, BIT 1 FOR RCV
002356  000000                  ERRFLG: .WORD   0               ;SUBROUTINE ERROR FLAG
002360  000000                  TIMFLG: .WORD   0               ;EVENT TIME-OUT FLAG
002362  000000                  RETADR: .WORD   0               ;SUBR ERROR RETURN ADDRESS
002364  000000                  REDBYT: .WORD   0               ;LO BYTE CONTAINS BYTE READ FROM LU REG
002366  000000                  WRIBYT: .WORD   0               ;LO BYTE CONTAINS BYTE TO LOAD INTO LU REG
002370  000000                  RAX15:  .WORD   0               ;LO BYTE CONTAINS BYTE READ FROM REG 15
002372  000000                  RAX16:  .WORD   0               ;LO BYTE CONTAINS BYTE READ FROM REG 16
002374  000000                  WAX15:  .WORD   0               ;LO BYTE CONTAINS BYTE TO LOAD INTO REG 15
002376  000000                  WAX16:  .WORD   0               ;LO BYTE CONTAINS BYTE TO LOAD INTO REG 16
002400  000000                  REGNUM: .WORD   0               ;NUMBER (10-17) OF LINE UNIT REG BEING TESTED
002402  000000                  AXNUM:  .WORD   0               ;NUMBER (0-7) OF EXTENDED REG BYTE BEING TESTED
002404  000000                  GOODAT: .WORD   0               ;STORAGE FOR EXPECTED DATA
002406  000000                  BADDAT: .WORD   0               ;STORAGE FOR ACTUAL DATA
002410  000000                  LOADAT: .WORD   0               ;CONTAINS TEST DATA LOADED INTO REG
002412  000000                  FRSTIM: .WORD   0               ;FLAG=0 IF PROGRAM JUST LOADED
002414  000000                  SAVE4:  .WORD   0               ;SAVE LOC 4 HERE (ERROR TRAP VECTOR)
002416  000000                  SAVE6:  .WORD   0               ;SAVE LOC 6 HERE (ERROR TRAP VECTOR)
002420  000000                  ERROR1: .WORD   0               ;SUBR ERROR BIT FLAGS (DEF'D IN GLOBAL EQUATES)
002422  000000                  TXWORD: .WORD   0               ;BITS 0-11 CONTAIN DATA TO LOAD INTO TX SILO
002424  000000                  RXWORD: .WORD   0               ;BITS 0-11 CONTAIN DATA READ FROM RCV SILO
002426  000000                  DISILO: .WORD   0               ;CONTAINS CURRENT STATE OF DISSI IN BIT 5
002430  000000                  CHPTYP: .WORD   0               ;USYRT CHIP TYPE, =0 FOR SIG, ELSE =1
002432  000000                  SAVLEN: .WORD   0               ;SAVED TX AND RCV CHAR LENGTHS
002434  000000                  DEVMAP: .WORD   0               ;BIT MAP OF ACTIVE DEVICES
002436  000000                  DEVPTR: .WORD   0               ;DEVICE MAP BIT POINTER
002440  000000                  UNIT:   .WORD   0               ;CONTAINS UNIT NO. (1 TO N)
002442  000000                  TSTNUM: .WORD   0               ;CONTAINS TEST NUMBER FOR SOME TESTS
002444  000000                  STARES: .WORD   0               ;FLAG=0 IF FIRST PASS AFTER STA OR RES

                                ;;*********  CURRENT DEVICE PARAMETERS  *************
002446  160170                  MPCSR:  .WORD   160170          ;POINTER TO MICROPROCESSOR CSR'S
002450  160171                  BSEL1:  .WORD   160171          ;POINTER TO BSEL1
002452  160172                  BSEL2:  .WORD   160172          ;POINTER TO BSEL2
002454                          BSEL4:
002454  160174                  SEL4:   .WORD   160174          ;POINTER TO SEL4
```

GLOBAL DATA SECTION

```
     58 002456  160176              SEL6:   .WORD   160176          ;POINTER TO SEL6
     59 002460  000300              MPIVEC: .WORD      300          ;MICROPROCESSOR INPUT INTERRUPT VECTOR
     60 002462  000304              MPOVEC: .WORD      304          ;MICROPROCESSOR OUTPUT INTERRUPT VECTOR
     61 002464  000240              MPRIOR: .WORD      240          ;MICROPROCESSOR DEVICE PRIORITY
     62 002466  000000              LUSWI1: .WORD        0          ;LINE UNIT SWITCH PACK #1
     63 002470  000000              LUSWI2: .WORD        0          ;LINE UNIT SWITCH PACK #2
     64 002472  000000              LUSWI3: .WORD        0          ;LINE UNIT SWITCH PACK #3
     65 002474  000000              TSTCON: .WORD        0          ;TEST CONNECTOR INDICATOR
     66 002476  000000              RUNINH: .WORD        0          ;RUN SWITCH INDICATOR
     67
     68                             ;***** STORAGE FOR DATA READ IN ADDRESS TESTS *****
     69 002500      000             FCDDAT: .BYTE   0
     70 002501      000                     .BYTE   0
     71 002502      000                     .BYTE   0
     72 002503      000                     .BYTE   0
     73 002504      000                     .BYTE   0
     74 002505      000                     .BYTE   0
     75 002506      000                     .BYTE   0
     76 002507      000                     .BYTE   0
     77
     78                             ;;****  GEN'L PURPOSE SCRATCH STORAGE  *****
     79 002510  000000              REG0:   .WORD   0
     80 002512  000000              REG1:   .WORD   0
     81 002514  000000              REG2:   .WORD   0
     82 002516  000000              REG3:   .WORD   0
     83 002520  000000              REG4:   .WORD   0
     84 002522  000000              REG5:   .WORD   0
     85 002524  000000              REG6:   .WORD   0
     86 002526  000000              REG7:   .WORD   0
     87
     88                             ;;****  SCRATCH STORAGE FOR MESSAGE REPORTING   *****
     89 002530  000000              TMP0:   .WORD   0
     90 002532  000000              TMP1:   .WORD   0
     91 002534  000000              TMP2:   .WORD   0
     92 002536  000000              TMP3:   .WORD   0
     93 002540  000000              TMP4:   .WORD   0
     94 002542  000000              TMP5:   .WORD   0
     95 002544  000000              TMP6:   .WORD   0
     96 002546  000000              TMP7:   .WORD   0
     97
     98                             ;***** INBUS LU REG BIT MASKS FOR UNPREDICTABLE BITS *****
     99 002550                      UPBITS:
    100 002550      000                     .BYTE   000             ;MASK FOR REG 10
    101 002551      056                     .BYTE   056             ;MASK FOR REG 11
    102 002552      000                     .BYTE   000             ;MASK FOR REG 12
    103 002553      257                     .BYTE   257             ;MASK FOR REG 13
    104 002554      100                     .BYTE   100             ;MASK FOR REG 14
    105 002555      377                     .BYTE   377             ;MASK FOR REG 15
    106 002556      377                     .BYTE   377             ;MASK FOR REG 16
    107 002557      306                     .BYTE   306             ;MASK FOR REG 17
    108
    109 002560      200             R14NRW: .BYTE   200             ;REG 14 NON-R/W BITS
    110
    111                             ;***** MASKS FOR EXTENDED REGISTER NON-READ/WRITE BITS *****
    112 002561                      ANBITS:
    113 002561      377                     .BYTE   377             ;MASK FOR AX0-15
    114 002562      377                     .BYTE   377             ;MASK FOR AX0-16
```

GLOBAL DATA SECTION

```
                                .BYTE   000             ;MASK FOR AX1-15
                                .BYTE   360             ;MASK FOR AX1-16
                                .BYTE   000             ;MASK FOR AX2-15
                                .BYTE   000             ;MASK FOR AX2-16
                                .BYTE   004             ;MASK FOR AX3-15
                                .BYTE   030             ;MASK FOR AX3-16

                        ;***** DATA PATTERN A *****
                        PATA:
                                .BYTE   125
                                .BYTE   252
                                .BYTE   000
                                .BYTE   377
                                .BYTE   001
                                .BYTE   002
                                .BYTE   004
                                .BYTE   010
                                .BYTE   020
                                .BYTE   040
                                .BYTE   100
                                .BYTE   200
                                .BYTE   376
                                .BYTE   375
                                .BYTE   373
                                .BYTE   367
                                .BYTE   357
                                .BYTE   337
                                .BYTE   277
                                .BYTE   177

                        ;***** DATA PATTERN B *****
                        PATB:
                                .BYTE   000
                                .BYTE   000
                                .BYTE   040
                                .BYTE   100
                                .BYTE   220
                                .BYTE   000
                                .BYTE   000
                                .BYTE   051

                        ;***** DATA PATTERN C *****
                        PATC:
                                .BYTE   020
                                .BYTE   020
                                .BYTE   020

                        ;***** DATA PATTERN D *****
                        PATD:
                                .BYTE   000
                                .BYTE   040
                                .BYTE   000

                        ;***** DATA PATTERN E *****
                        PATE:
                                .BYTE   000
                                .BYTE   120
```

```
    172 002635      020                         .BYTE   020
    173 002636      100                         .BYTE   100
    174 002637      120                         .BYTE   120
    175 002640      000                         .BYTE   000
    176
    177                                 ;***** DATA PATTERN F *****
    178 002641                          PATF:
    179 002641      050                         .BYTE   050
    180 002642      051                         .BYTE   051
    181 002643      050                         .BYTE   050
    182
    183                                 ;***** DATA PATTERN G *****
    184 002644                          PATG:
    185 002644      000                         .BYTE   000
    186 002645      000                         .BYTE   000
    187 002646      240                         .BYTE   240
    188 002647      120                         .BYTE   120
    189 002650      177                         .BYTE   177
    190 002651      000                         .BYTE   000
    191 002652      000                         .BYTE   000
    192 002653      001                         .BYTE   001
    193
    194                                 ;***** DATA PATTERN H *****
    195 002654                          PATH:
    196 002654      000                         .BYTE   000
    197 002655      000                         .BYTE   000
    198 002656      377                         .BYTE   377
    199 002657      017                         .BYTE   017
    200 002660      377                         .BYTE   377
    201 002661      377                         .BYTE   377
    202 002662      375                         .BYTE   375
    203 002663      377                         .BYTE   377
    204
    205                                 ;***** DATA PATTERN I *****
    206 002664                          PATI:
    207 002664      000                         .BYTE   000
    208 002665      000                         .BYTE   000
    209 002666      000                         .BYTE   000
    210 002667      000                         .BYTE   000
    211 002670      000                         .BYTE   000
    212 002671      103                         .BYTE   103
    213 002672      000                         .BYTE   000
    214 002673      000                         .BYTE   000
    215
    216                                 ;***** DATA PATTERN J *****
    217 002674                          PATJ:
    218 002674      000                         .BYTE   000
    219 002675      000                         .BYTE   000
    220 002676      010                         .BYTE   010
    221 002677      002                         .BYTE   002
    222 002700      004                         .BYTE   004
    223 002701      103                         .BYTE   103
    224 002702      001                         .BYTE   001
    225 002703      100                         .BYTE   100
    226
    227                                 ;***** DATA PATTERN K *****
    228 002704      000                 PATK:   .BYTE   000
```

```
    229 002705  000                 .BYTE   000
    230 002706  377                 .BYTE   377
    231 002707  377                 .BYTE   377
    232 002710  125                 .BYTE   125
    233 002711  125                 .BYTE   125
    234 002712  252                 .BYTE   252
    235 002713  252                 .BYTE   252
    236 002714  001                 .BYTE   001
    237 002715  000                 .BYTE   000
    238 002716  002                 .BYTE   002
    239 002717  000                 .BYTE   000
    240 002720  004                 .BYTE   004
    241 002721  000                 .BYTE   000
    242 002722  010                 .BYTE   010
    243 002723  000                 .BYTE   000
    244 002724  020                 .BYTE   020
    245 002725  000                 .BYTE   000
    246 002726  040                 .BYTE   040
    247 002727  000                 .BYTE   000
    248 002730  100                 .BYTE   100
    249 002731  000                 .BYTE   000
    250 002732  200                 .BYTE   200
    251 002733  000                 .BYTE   000
    252 002734  000                 .BYTE   000
    253 002735  001                 .BYTE   001
    254 002736  000                 .BYTE   000
    255 002737  002                 .BYTE   002
    256 002740  000                 .BYTE   000
    257 002741  004                 .BYTE   004
    258 002742  000                 .BYTE   000
    259 002743  010                 .BYTE   010
    260 002744  000                 .BYTE   000
    261 002745  020                 .BYTE   020
    262 002746  000                 .BYTE   000
    263 00274?  040                 .BYTE   040
    264 002750  000                 .BYTE   000
    265 002751  100                 .BYTE   100
    266 002752  000                 .BYTE   000
    267 002753  200                 .BYTE   200
    268 002754  376                 .BYTE   376
    269 002755  377                 .BYTE   377
    270 002756  375                 .BYTE   375
    271 002757  377                 .BYTE   377
    272 002760  373                 .BYTE   373
    273 002761  377                 .BYTE   377
    274 002762  367                 .BYTE   367
    275 002763  377                 .BYTE   377
    276 002764  357                 .BYTE   357
    277 002765  377                 .BYTE   377
    278 002766  337                 .BYTE   337
    279 002767  377                 .BYTE   377
    280 002770  277                 .BYTE   277
    281 002771  377                 .BYTE   377
    282 002772  177                 .BYTE   177
    283 002773  377                 .BYTE   377
    284 002774  377                 .BYTE   377
    285 002775  376                 .BYTE   376
```

```
    286 002776      377                         .BYTE   377
    287 002777      375                         .BYTE   375
    288 003000      377                         .BYTE   377
    289 003001      373                         .BYTE   373
    290 003002      377                         .BYTE   377
    291 003003      367                         .BYTE   367
    292 003004      377                         .BYTE   377
    293 003005      357                         .BYTE   357
    294 003006      377                         .BYTE   377
    295 003007      337                         .BYTE   337
    296 003010      377                         .BYTE   377
    297 003011      277                         .BYTE   277
    298 003012      377                         .BYTE   377
    299 003013      177                         .BYTE   177
    300
    301                                 ;***** DATA PATTERN L *****
    302 003014                          PATL:
    303 003014      000                         .BYTE   000
    304 003015      000                         .BYTE   000
    305 003016      377                         .BYTE   377
    306 003017      377                         .BYTE   377
    307 003020      000                         .BYTE   000
    308 003021      000                         .BYTE   000
    309
    310                                 ;***** DATA PATTERN M *****
    311 003022                          PATM:
    312 003022      000                         .BYTE   000
    313 003023      020                         .BYTE   020
    314 003024      000                         .BYTE   000
    315 003025      000                         .BYTE   000
    316 003026      200                         .BYTE   200
    317 003027      000                         .BYTE   000
    318 003030      000                         .BYTE   000
    319 003031      051                         .BYTE   051
    320
    321                                 ;***** DATA PATTERN N *****
    322 003032                          PATN:
    323 003032      000                         .BYTE   000
    324 003033      000                         .BYTE   000
    325 003034      000                         .BYTE   000
    326 003035      125                         .BYTE   125
    327 003036      000                         .BYTE   000
    328 003037      252                         .BYTE   252
    329 003040      000                         .BYTE   000
    330 003041      377                         .BYTE   377
    331 003042      005                         .BYTE   005
    332 003043      000                         .BYTE   000
    333 003044      012                         .BYTE   012
    334 003045      000                         .BYTE   000
    335 003046      017                         .BYTE   017
    336 003047      000                         .BYTE   000
    337
    338                                 ;***** DATA PATTERN O *****
    339 003050                          PATO:
    340 003050      000                         .BYTE   000
    341 003051      041                         .BYTE   041
    342 003052      004                         .BYTE   004
```

```
    343 003053      010                         .BYTE   010
    344 003054      020                         .BYTE   020
    345 003055      040                         .BYTE   040
    346 003056      100                         .BYTE   100
    347 003057      101                         .BYTE   101
    348 003060      200                         .BYTE   200
    349 003061      201                         .BYTE   201
    350 003062      300                         .BYTE   300
    351 003063      111                         .BYTE   111
    352 003064      301                         .BYTE   301
    353 003065      375                         .BYTE   375
    354
    355                                 ;***** DATA PATTERN P *****
    356 003066                          PATP:
    357 003066      000                         .BYTE   000
    358 003067      113                         .BYTE   113
    359 003070      200                         .BYTE   200
    360 003071      040                         .BYTE   040
    361 003072      020                         .BYTE   020
    362 003073      010                         .BYTE   010
    363 003074      001                         .BYTE   001
    364 003075      104                         .BYTE   104
    365 003076      007                         .BYTE   007
    366 003077      105                         .BYTE   105
    367 003100      007                         .BYTE   007
    368 003101      144                         .BYTE   144
    369 003102      107                         .BYTE   107
    370 003103      157                         .BYTE   157
    371
    372                                 ;***** DATA PATTERN U *****
    373 003104      000                 PATU:   .BYTE   000
    374 003105      000                         .BYTE   000
    375 003106      001                         .BYTE   001
    376 003107      000                         .BYTE   000
    377 003110      013                         .BYTE   013
    378 003111      000                         .BYTE   000
    379 003112      011                         .BYTE   011
    380 003113      000                         .BYTE   000
    381 003114      021                         .BYTE   021
    382 003115      000                         .BYTE   000
    383 003116      101                         .BYTE   101
    384 003117      000                         .BYTE   000
    385 003120      301                         .BYTE   301
    386 003121      000                         .BYTE   000
    387 003122      000                         .BYTE   000
    388 003123      001                         .BYTE   001
    389 003124      000                         .BYTE   000
    390 003125      002                         .BYTE   002
    391 003126      000                         .BYTE   000
    392 003127      004                         .BYTE   004
    393 003130      000                         .BYTE   000
    394 003131      040                         .BYTE   040
    395 003132      000                         .BYTE   000
    396 003133      100                         .BYTE   100
    397 003134      000                         .BYTE   000
    398 003135      200                         .BYTE   200
    399 003136      000                         .BYTE   000
```

```
    400 003137      346                         .BYTE   346
    401 003140      000                         .BYTE   000
    402 003141      345                         .BYTE   345
    403 003142      000                         .BYTE   000
    404 003143      343                         .BYTE   343
    405 003144      000                         .BYTE   000
    406 003145      307                         .BYTE   307
    407 003146      000                         .BYTE   000
    408 003147      247                         .BYTE   247
    409 003150      000                         .BYTE   000
    410 003151      147                         .BYTE   147
    411
    412                                 ;***** PATTERN V *****
    413 003152      000                 PATV:   .BYTE   000
    414 003153      000                         .BYTE   000
    415 003154      333                         .BYTE   333
    416 003155      000                         .BYTE   000
    417 003156      331                         .BYTE   331
    418 003157      000                         .BYTE   000
    419 003160      323                         .BYTE   323
    420 003161      000                         .BYTE   000
    421 003162      313                         .BYTE   313
    422 003163      000                         .BYTE   000
    423 003164      233                         .BYTE   233
    424 003165      000                         .BYTE   000
    425 003166      133                         .BYTE   133
    426 003167      000                         .BYTE   000
    427 003170      000                         .BYTE   000
    428 003171      001                         .BYTE   001
    429 003172      000                         .BYTE   000
    430 003173      002                         .BYTE   002
    431 003174      000                         .BYTE   000
    432 003175      004                         .BYTE   004
    433 003176      000                         .BYTE   000
    434 003177      040                         .BYTE   040
    435 003200      000                         .BYTE   000
    436 003201      100                         .BYTE   100
    437 003202      000                         .BYTE   000
    438 003203      200                         .BYTE   200
    439 003204      000                         .BYTE   000
    440 003205      346                         .BYTE   346
    441 003206      000                         .BYTE   000
    442 003207      345                         .BYTE   345
    443 003210      000                         .BYTE   000
    444 003211      343                         .BYTE   343
    445 003212      000                         .BYTE   000
    446 003213      307                         .BYTE   307
    447 003214      000                         .BYTE   000
    448 003215      247                         .BYTE   247
    449 003216      000                         .BYTE   000
    450 003217      147                         .BYTE   147
    451
    452 003220                          ENDPAT:
    453                                 .EVEN
    454
    455
    456
```

```
                                        ;***  TEST MESSAGES TO BE TRANSMITTED  ***

003220  000400                        MSG1:   TXSOM
003222  000400                                TXSOM
003224  000000                                000
003226  000125                                125
003230  000252                                252
003232  000377                                377
003234  000000                                000
003236  001000                                TXEOM
003240  001000                                TXEOM
003242  001000                                TXEOM
003244  001000                                TXEOM

003246  000377                        MSG4:   377
003250  000000                                000
003252  000125                                125
003254  000252                                252
003256  001000                                TXEOM
003260  001000                                TXEOM


                                        ;*** RECEIVED DATA BUFFER (64. WORDS) ***
003262                                  RCVBUF: .BLKW   64.
```

```
                                        .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
                                        ;;*************************************************************************
003462                                          DEVTYP  <M8203>
003462                                                                          L$DVTYP::
003462  115     070     062                                                             .ASCIZ  /M8203/
003465  060     063     000
                                                                                        .EVEN

                                        ;;*************************************************************************
                                        ;* TITLE OF PROGRAM
                                        ;;*************************************************************************
003470                                          DESCRIPT        <M8203 STATIC LOGIC TESTS - PART 1 OF 2>
003470                                                                          L$DESC::
003470  115     070     062                                                             .ASCIZ  /M8203 STATIC LOGIC
003473  060     063     040
003476  123     124     101
003501  124     111     103
003504  040     114     117
003507  107     111     103
003512  040     124     105
003515  123     124     123
003520  040     055     040
003523  120     101     122
003526  124     040     061
003531  040     117     106
003534  040     062     000
                                                                                        .EVEN


                                        ;
                                        ; FORMAT STATEMENTS USED IN PRINT CALLS
                                        ;

                                        ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
                                        ;       INSERT THE FORMAT STATEMENTS USED IN THE VARIOUS PRINT CALLS.
                                        ;       USE THE .ASCIZ STATEMENT.
                                        ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

```
                                .SBTTL  GLOBAL SUBROUTINES

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



                                ;*******************************************************************************
                                ;* STPCLK - THIS SUBROUTINE FORCES THE DMC11 OR KMC11 MICROPROCESSOR TO
                                ;*      EXECUTE AN INSTRUCTION WHICH IS PASSED IN THE WORD FOLLOWING THE CALL.
                                ;*******************************************************************************
003540                          STPCLK:
003540  152777  000006  176702          BISB    #ROMO!ROMI,@BSEL1       ;SET ROMO, ROMI BITS IN BSEL1
003546  017677  000000  176702          MOV     @(SP),@SEL6     ;PUT INSTRUCTION INTO SEL6
003554  152777  000007  176666          BISB    #ROMO!ROMI!STEPMP,@BSEL1 ;SET ROMO, ROMI, STEPMP IN BSEL1
003562  142777  000007  176660          BICB    #ROMO!ROMI!STEPMP,@BSEL1 ;CLEAR ROMO, ROMI, STEPMP IN BSEL1
003570  062716  000002                  ADD     #2,(SP)         ;FIX UP RETURN PC
003574  000207                          RTS     PC              ;RETURN



                                ;*******************************************************************************
                                ;* MSTCLR - THIS SUBROUTINE ISSUES A MASTER CLEAR AND SETS LULOOP
                                ;*******************************************************************************
003576                          MSTCLR:
003576  010146                          MOV     R1,-(SP)        ;SAVE R1
003600  013746  002400                  MOV     REGNUM,-(SP)    ;SAVE LU REG NO.
003604  112777  000100  176636          MOVB    #MCLR,@BSEL1    ;SET MASTER CLEAR BIT
003612  142777  000300  176630          BICB    #RUN!MCLR,@BSEL1 ;CLEAR RUN AND MCLR BITS
003620  012701  000024                  MOV     #20.,R1         ;INITIALIZE STALL COUNTER
003624  000240                  2$:     NOP                     ;STALL IN LOOP FOR SEVERAL MICRO-SEC
003626  005301                          DEC     R1
003630  001375                          BNE     2$
003632  152777  000010  176610          BISB    #LULOOP,@BSEL1  ;SET LU LOOP
003640  012737  000013  002400          MOV     #13,REGNUM      ;SET LU REG NO. = 13
003646  005037  002366                  CLR     WRIBYT
003652  004737  003750                  JSR     PC,WRITLU       ;CLEAR REG 13
003656  012637  002400                  MOV     (SP)+,REGNUM    ;RESTORE LU REG NO.
003662  012601                          MOV     (SP)+,R1        ;RESTORE R1
003664  005037  002432                  CLR     SAVLEN          ;CLEAR CHAR LENGTH FROM SETUP
003670  000207                          RTS     PC              ;RETURN



                                ;*******************************************************************************
                                ;* READLU - THIS SUBROUTINE FORCES THE DMC11 OR KMC11 MICROPROCESSOR
                                ;*      TO EXECUTE AN INSTRUCTION WHICH READS THE LINE UNIT REG WHOSE
                                ;*      NUMBER IS PASSED IN REGNUM, INTO REDBYT.
                                ;*******************************************************************************
003672                          READLU:
```

```
                                                MOV     R1,-(SP)        ;SAVE R1
                                                MOV     REGNUM,R1       ;GET LINE UNIT REG NUMBER
                                                ASL     R1              ;SHIFT INTO SOURCE BITS 4-7
                                                ASL     R1
                                                ASL     R1
                                                ASL     R1
                                                BIS     #4,R1           ;SET DESTINATION = BSEL4
                                                BIS     #MVIOX,R1       ;SET REST OF MOVE INSTRUCTION
                                                MOV     R1,2$           ;SET INSTRUCTION AS SUBROUTINE ARGUMENT
                                                JSR     PC,STPCLK       ;EXECUTE MOVE INSTRUCTION
                                        2$:     .WORD   0               ;INSTRUCTION GOES HERE
                                                MOVB    @BSEL4,REDBYT   ;GET LU REG CONTENTS INTO REDBYT
                                                CLRB    REDBYT+1        ;CLR HI BYTE OF STORAGE
                                                MOV     (SP)+,R1        ;RESTORE R1
                                                RTS     PC              ;RETURN


                        ;*******************************************************************************
                        ;* WRITLU - THIS SUBROUTINE FORCES THE DMC11 OR KMC11 MICROPROCESSOR TO
                        ;*      EXECUTE AN INSTRUCTION WHICH LOADS THE BYTE CONTAINED IN WRIBYT
                        ;*      INTO THE LU REG WHOSE NUMBER IS PASSED IN REGNUM.
                        ;*******************************************************************************
                        WRITLU:
                                                MOV     R1,-(SP)        ;SAVE R1
                                                MOV     REGNUM,R1       ;GET LINE UNIT REG NUMBER
                                                BIS     #100,R1         ;SET SOURCE = BSEL4
                                                BIS     #MVIXO,R1       ;SET REST OF MOVE INSTRUCTION
                                                MOV     R1,2$           ;SET INSTRUCTION AS SUBROUTINE ARGUMENT
                                                CLRB    WRIBYT+1        ;CLR HI BYTE OF STORAGE
                                                MOVB    WRIBYT,@BSEL4   ;LOAD BYTE INTO BSEL4
                                                JSR     PC,STPCLK       ;EXECUTE MOVE INSTRUCTION
                                        2$:     .WORD   0
                                                MOV     (SP)+,R1        ;RESTORE R1
                                                RTS     PC              ;RETURN


                        ;*******************************************************************************
                        ;* GETREG - THIS SUBROUTINE READS THE LINE UNIT REGISTERS 10-17 INTO THE
                        ;*      REGISTER STORAGE TABLE (LUREG:).
                        ;*******************************************************************************
                        GETREG: MOV     R1,-(SP)        ;SAVE R1
                                                MOV     REGNUM,-(SP)    ;SAVE CURRENT REG NO.
                                                MOV     #LUR10,R1       ;INIT POINTER TO REG STORACE TABLE
                                                MOV     #10,REGNUM      ;INIT LU REG NO. TO 10
                                        3$:     JSR     PC,READLU       ;READ A LINE UNIT REG
                                                MOVB    REDBYT,(R1)+    ;PUT BYTE READ INTO TABLE
                                                CLRB    (R1)+           ;CLEAR UPPER BYTE OF TABLE ENTRY
                                                INC     REGNUM          ;INCREMENT REG NO.
                                                CMP     REGNUM,#20      ;SEE IF ALL REGS READ YET
                                                BLT     3$              ;BR IF NOT
                                                MOV     (SP)+,REGNUM    ;RESTORE CURRENT REG NO.
```

```
                        MOV     (SP)+,R1        ;RESTORE R1
                        RTS     PC              ;RETURN


                ;*******************************************************************************
                ;* LOOPIN - THIS SUBROUTINE PLACES THE MICROPROCESSOR IN A LOOP ON AN
                ;*      INSTRUCTION, BY MOVING THE INSTRUCTION FROM THE WORD FOLLOWING THE CALL
                ;*      INTO SEL6, AND SETTING RUN AND ROMI IN BSEL1. THE SUBROUTINE RETURNS
                ;*      WITH THE MICROPROCESSOR STUCK IN THE LOOP, AND IF IT IS DESIRED TO
                ;*      TERMINATE THE LOOP, THE PDP-11 PROGRAM MUST CLEAR THE RUN BIT IN
                ;*      BSEL1, OR CALL SUBROUTINE MSTCLR TO DO THIS.
                ;*******************************************************************************
004074          LOOPIN:
004074  152777  000006  176346          BISB    #ROMO!ROMI,@BSEL1       ;SET ROMO, ROMI BITS IN BSEL1
004102  017677  000000  176346          MOV     @(SP),@SEL6     ;PUT MICROINSTRUCTION INTO SEL6
004110  152777  000206  176332          BISB    #RUN!ROMO!ROMI,@BSEL1 ;SET RUN, ROMO, ROMI IN BSEL1
004116  062716  000002                  ADD     #2,(SP)         ;FIX UP RETURN PC
004122  000207                          RTS     PC              ;RETURN WITH MICROPROCESSOR STUCK IN SINGLE
                                                                ;    INSTRUCTION LOOP


                ;*******************************************************************************
                ;* READAX - THIS SUBROUTINE READS THE USYRT REG PAIR WHOSE NUMBER (0-3)
                ;*      IS PASSED IN BITS 1,2 OF AXNUM ON ENTRY, AND RETURNS THE BYTES READ IN
                ;*      RAX15 AND RAX16. IF THE LINE UNIT DOES NOT RESPOND WITH READY IN REG 14,
                ;*      RRDYTO BIT IS SET IN ERROR1 ON RETURN.
                ;*******************************************************************************
004124  010146          READAX: MOV     R1,-(SP)        ;SAVE R1
004126  013746  002400          MOV     REGNUM,-(SP)    ;STORE CURRENT REG NO.
004132  042737  000001  002420          BIC     #RRDYTO,ERROR1  ;CLEAR ERROR BIT
004140  012737  000014  002400          MOV     #14,REGNUM      ;SET LU REG NO. = 14
004146  113737  002402  002366          MOVB    AXNUM,WRIBYT    ;SET UP AX REG NO. BITS
004154  006237  002366                  ASR     WRIBYT
004160  152737  000024  002366          BISB    #RDAX!ENAX,WRIBYT ;SET UP BITS TO LOAD INTO REG 14
004166  053737  002426  002366          BIS     DISILO,WRIBYT   ;SET PROPER STATE OF DISSI BIT
004174  004737  003750                  JSR     PC,WRITLU       ;SET RDAX AND ENAX IN REG 14
004200  005001                          CLR     R1              ;INIT TIMER
004202  004737  003672          6$:     JSR     PC,READLU       ;READ REG 14
004206  132737  000200  002364          BITB    #READY,REDBYT   ;SEE IF READY BIT SET IN REG 14 YET
004214  001006                          BNE     9$              ;BR IF READY SET
004216  005201                          INC     R1              ;INCR TIMER
004220  001370                          BNE     6$              ;BR IF TIMER DIDN'T TIME OUT YET
004222  052737  000001  002420          BIS     #RRDYTO,ERROR1  ;SET ERROR FLAG FOR TIME OUT ON READ RDY
004230  000424                          BR      12$             ;BR TO RETURN
004232  012737  000015  002400  9$:     MOV     #15,REGNUM      ;SET REG NO. = 15
004240  004737  003672                  JSR     PC,READLU       ;READ REG 15
004244  113737  002364  002370          MOVB    REDBYT,RAX15    ;STORE REG AX-15
004252  105037  002371                  CLRB    RAX15+1         ;CLR HI BYTE OF STORAGE
004256  012737  000016  002400          MOV     #16,REGNUM      ;SET REG NO. = 16
004264  004737  003672                  JSR     PC,READLU       ;READ REG 16
004270  113737  002364  002372          MOVB    REDBYT,RAX16    ;STORE REG AX-16
```

```
                        CLRB    RAX16+1         ;CLR HI BYTE OF STORAGE
                12$:    MOV     (SP)+,REGNUM    ;RESTORE CURRENT REG NO.
                        MOV     (SP)+,R1        ;RESTORE R1
                        RTS     PC              ;RETURN


                ;*******************************************************************************
                ;* WRITAX - THIS SUBROUTINE WRITES THE USYRT REG PAIR WHOSE NUMBER (0-3) IS
                ;*      PASSED IN BITS 1,2 OF AXNUM ON ENTRY, WITH THE DATA FROM WAX15 AND
                ;*      WAX16. IF LINE UNIT DOES NOT RESPOND WITH READY IN REG 14, WRDYTO BIT
                ;*      IS SET IN ERROR1 ON RETURN.
                ;*******************************************************************************
                WRITAX: MOV     R1,-(SP)        ;SAVE R1
                        MOV     REGNUM,-(SP)    ;SAVE CURRENT REG NO.
                        BIC     #WRDYTO,ERROR1  ;CLEAR ERROR BIT
                        MOV     #14,REGNUM      ;SET LU REG NO. = 14
                        MOVB    AXNUM,WRIBYT    ;SET AX REG NO. BITS
                        ASR     WRIBYT
                        BIS     DISILO,WRIBYT   ;SET PROPER STATE OF DISSI BIT
                        JSR     PC,WRITLU       ;SET AX NO. BITS IN REG 14
                        MOV     #15,REGNUM      ;SET REG NO. = 15
                        CLRB    WAX15+1         ;CLR HI BYTE OF STORAGE
                        MOVB    WAX15,WRIBYT    ;SET UP BYTE TO WRITE INTO REG 15
                        JSR     PC,WRITLU       ;WRITE BYTE INTO REG 15
                        INC     REGNUM          ;SET REG NO. = 16
                        CLRB    WAX16+1         ;CLR HI BYTE OF STORAGE
                        MOVB    WAX16,WRIBYT    ;SET UP BYTE TO WRITE INTO REG 16
                        JSR     PC,WRITLU       ;WRITE BYTE INTO REG 16
                        MOV     #14,REGNUM      ;SET REG NO. = 14
                        MOVB    AXNUM,WRIBYT    ;SET AX REG NO. BITS
                        ASR     WRIBYT
                        BISB    #ENAX!WAX,WRIBYT ;SET UP BITS TO LOAD INTO REG 14
                        BIS     DISILO,WRIBYT   ;SET PROPER STATE OF DISSI BIT
                        JSR     PC,WRITLU       ;SET ENAX AND WAX IN REG 14
                        CLR     R1              ;INIT PROGRAM TIMER
                6$:     JSR     PC,READLU       ;READ REG 14
                        BITB    #READY,REDBYT   ;SEE IF READY BIT SET IN REG 14 YET
                        BNE     9$              ;BR IF READY SET
                        INC     R1              ;INCR TIMER
                        BNE     6$              ;BR IF TIMER DIDN'T TIME OUT YET
                        BIS     #WRDYTO,ERROR1  ;SET ERROR FLAG BIT FOR TIME OUT ON WRITE RDY
                9$:     MOV     (SP)+,REGNUM    ;RESTORE CURRENT REG NO.
                        MOV     (SP)+,R1        ;RESTORE R1
                        RTS     PC              ;RETURN


                ;*******************************************************************************
                ;* GETALL - THIS SUBROUTINE READS THE LINE UNIT REGS 10-17 AND THE EXTENDED
                ;*      REGISTERS AX0-AX3 INTO REGISTER STORAGE TABLE (LUREG:).
                ;*******************************************************************************
                GETALL: MOV     R1,-(SP)        ;SAVE R1
                        MOV     AXNUM,-(SP)     ;SAVE CURRENT AX REG BYTE NO.
```

```
                                                                                                                    
    229 004534  012737  014435  002530          MOV     #DH5,TMP0       ;SET AX LO BYTE NO.
    230 004542  032737  000001  002402          BIT     #BIT0,AXNUM     ;SEE IF LO OR HI BYTE
    231 004550  001403                          BEQ     1$              ;BR IF LO BYTE
    232 004552  012737  014440  002530          MOV     #DH6,TMP0       ;SET AX HI BYTE NO.
    233 004560  004737  004016          1$:     JSR     PC,GETREG       ;READ AND STORE REGS 10-17
    234 004564  142777  000010  175656          BICB    #LULOOP,@BSEL1  ;CLEAR LULOOP
    235 004572  012701  002322                  MOV     #AX0.15,R1      ;INIT POINTER TO REG STORAGE TABLE
    236 004576  005037  002402                  CLR     AXNUM           ;INIT AX REG BYTE NO. TO 0
    237 004602  004737  004124          3$:     JSR     PC,READAX       ;READ 2 AX REG BYTES
    238 004606  113721  002370                  MOVB    RAX15,(R1)+     ;PUT LO BYTE READ INTO TABLE
    239 004612  105021                          CLRB    (R1)+           ;CLEAR UPPER BYTE OF TABLE ENTRY
    240 004614  113721  002372                  MOVB    RAX16,(R1)+     ;PUT HI BYTE READ INTO TABLE
    241 004620  105021                          CLRB    (R1)+           ;CLEAR UPPER BYTE OF TABLE ENTRY
    242 004622  062737  000002  002402          ADD     #2,AXNUM        ;INCR AX REG BYTE NO.
    243 004630  023727  002402  000010          CMP     AXNUM,#10       ;SEE IF ALL REGS READ YET
    244 004636  002761                          BLT     3$              ;BR IF NOT
    245 004640  012637  002402                  MOV     (SP)+,AXNUM     ;RESTORE CURRENT AX REG BYTE NO.
    246 004644  012601                          MOV     (SP)+,R1        ;RESTORE R1
    247 004646  013737  002402  002532          MOV     AXNUM,TMP1
    248 004654  006237  002532                  ASR     TMP1            ;GET EXTENDED REG NO. FOR PRINTOUT
    249 004660  000207                          RTS     PC              ;RETURN
    250
    251
    252
    253
    254
    255                             ;*****************************************************************************
    256                             ;* OSIRDY - THIS SUBROUTINE CHECKS FOR THE PROPER STATES OF ORDY (REG 11)
    257                             ;*      AND OCOR (REG 17) AND REPORTS AN ERROR IF EITHER IS NOT PROPERLY SET
    258                             ;*      AS PASSED IN BIT 0 (ORDY) AND BIT 1 (OCOR) OF THE WORD FOLLOWING THE
    259                             ;*      CALL.
    260                             ;*      IF AN ERROR OCCURS, A RETURN IS MADE TO THE TEST, AT THE ADDRESS IN
    261                             ;*      RETADR.
    262                             ;*****************************************************************************
    263 004662  013746  002400      OSIRDY: MOV     REGNUM,-(SP)    ;SAVE LU REG NO.
    264 004666  013746  002352              MOV     SUBRPC,-(SP)
    265 004672  005737  002352              TST     SUBRPC          ;SEE IF THIS IS A NESTED CALL
    266 004676  001006                      BNE     1$              ;BR IF YES
    267 004700  016637  000004  002352      MOV     4(SP),SUBRPC
    268 004706  162737  000004  002352      SUB     #4,SUBRPC       ;GET PC OF SUBROUTINE CALL
    269 004714  012737  000011  002400  1$: MOV     #11,REGNUM      ;SET REG NO. TO 11
    270 004722  004737  003672              JSR     PC,READLU       ;READ REG 11
    271 004726  032776  000001  000004      BIT     #BIT0,@4(SP)    ;GET EXPECTED STATE OF ORDY
    272 004734  001413                      BEQ     3$              ;BR IF EXPECTED ORDY = 0
    273 004736  132737  000020  002364      BITB    #ORDY,REDBYT    ;SEE IF ORDY = 1
    274 004744  001022                      BNE     9$              ;BR IF ORDY = 1
    275 004746  004737  004526              JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
    276                             ;REPORT ORDY NOT SET
    277 004752                              ERRDF   7,EM7,ERR4
        004752  104455                                                              TRAP    C$ERDF
        004754  000007                                                              .WORD   7
        004756  012374                                                              .WORD   EM7
        004760  015622                                                              .WORD   ERR4
    278 004762  000451                      BR      16$             ;TAKE ERROR RETURN
    279 004764  132737  000020  002364  3$: BITB    #ORDY,REDBYT    ;SEE IF ORDY = 0
    280 004772  001407                      BEQ     9$              ;BR IF ORDY = 0
    281 004774  004737  004526              JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
```

```
                                        ;REPORT ORDY NOT CLEARED
                                                ERRDF   8,EM8,ERR4
005000  104455                                                                 TRAP    C$ERDF
005002  000010                                                                .WORD   8
005004  012411                                                                .WORD   EM8
005006  015622                                                                .WORD   ERR4
005010  000436                                BR      16$             ;TAKE ERROR RETURN
005012  012737  000017  002400  9$:           MOV     #17,REGNUM      ;SET REG NO. = 17
005020  004737  003572                        JSR     PC,READLU       ;READ LU REG 17
005024  132776  000002  000004                BITB    #BIT1,@4(SP)    ;GET EXPECTED STATE OF OCOR
005032  001413                                BEQ     12$             ;BR IF EXPECTED OCOR = 0
005034  132737  000020  002364                BITB    #OCOR,REDBYT    ;SEE IF OCOR = 1
005042  001031                                BNE     20$             ;BR IF OCOR = 1
005044  004737  004526                        JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                                        ;REPORT OCOR NOT SET
005050                                          ERRDF   9,EM9,ERR4
005050  104455                                                                 TRAP    C$ERDF
005052  000011                                                                .WORD   9
005054  012432                                                                .WORD   EM9
005056  015622                                                                .WORD   ERR4
005060  000412                                BR      16$             ;TAKE ERROR RETURN
005062  132737  000020  002364  12$:          BITB    #OCOR,REDBYT    ;SEE IF OCOR = 0
005070  001416                                BEQ     20$             ;BR IF OCOR = 0
005072  004737  004526                        JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                                        ;REPORT OCOR NOT CLEARED
005076                                          ERRDF   10,EM10,ERR4
005076  104455                                                                 TRAP    C$ERDF
005100  000012                                                                .WORD   10
005102  012447                                                                .WORD   EM10
005104  015622                                                                .WORD   ERR4
005106  016637  000002  002400  16$:          MOV     2(SP),REGNUM    ;RESTORE LU REG NO.
005114  013706  002346                        MOV     PSTACK,SP       ;RESTORE STACK POINTER TO BASE LEVEL
005120  013746  002362                        MOV     RETADR,-(SP)    ;FIX ERROR RETURN PC
005124  000407                                BR      23$
005126  062766  000002  000004  20$:          ADD     #2,4(SP)        ;FIX UP ERROR-FREE RETURN PC
005134  012637  002352                        MOV     (SP)+,SUBRPC
005140  012637  002400                        MOV     (SP)+,REGNUM    ;RESTORE LU REG NO.
005144  000207                  23$:          RTS     PC              ;RETURN


                                        ;*******************************************************************************
                                        ;* WAIT50 - THIS SUBROUTINE STALLS FOR AT LEAST 50 MICRO-SEC, AND THEN RETURNS.
                                        ;*******************************************************************************
005146  010146                  WAIT50: MOV     R1,-(SP)        ;SAVE R1
005150  012701  000310                  MOV     #200.,R1        ;INIT COUNTER
005154  005301                  3$:     DEC     R1              ;DECREMENT COUNTER
005156  001376                          BNE     3$              ;BR IF NOT DONE YET
005160  012601                          MOV     (SP)+,R1        ;RESTORE R1
005162  000207                          RTS     PC              ;RETURN
```

```
                                        ;*********************************************************************************
                                        ;* STALL - THIS SUBROUTINE STALLS FOR ABOUT A MICRO-SEC.
                                        ;*********************************************************************************
005164  000240                  STALL:  NOP
005166  000240                          NOP
005170  000240                          NOP
005172  000207                          RTS     PC
                                        ;*********************************************************************************
                                        ;* LDTXSI - THIS SUBROUTINE LOADS THE TX SILO (REGS 10,11) WITH THE DATA PASSED
                                        ;*       IN BITS 0-11 OF TXWORD.
                                        ;*********************************************************************************
005174  013746  002400          LDTXSI: MOV     REGNUM,-(SP)    ;SAVE LU REG NO.
005200  042737  170000  002422          BIC     #170000,TXWORD  ;CLEAR UNUSED BITS
005206  012737  000011  002400          MOV     #11,REGNUM      ;SET REG NO. = 11
005214  113737  002423  002366          MOVB    TXWORD+1,WRIBYT ;SET DATA TO BE WRITTEN INTO REG 11
005222  004737  003750                  JSR     PC,WRITLU       ;LOAD DATA INTO REG 11
005226  012737  000010  002400          MOV     #10,REGNUM      ;SET REG NO. = 10
005234  113737  002422  002366          MOVB    TXWORD,WRIBYT   ;SET DATA TO BE WRITTEN INTO REG 10
005242  004737  003750                  JSR     PC,WRITLU       ;LOAD DATA INTO REG 10
005246  012637  002400                  MOV     (SP)+,REGNUM    ;RESTORE LU REG NO.
005252  000207                          RTS     PC              ;RETURN
                                        ;*********************************************************************************
                                        ;* STPLU - THIS SUBROUTINE CLOCKS THE LINE UNIT FOR THE NO. OF CYCLES PASSED
                                        ;*       IN BITS 0-14 OF THE WORD FOLLOWING THE CALL.
                                        ;*       IF BIT 15 = 1, A CHECK IS MADE TO DETERMINE IF THE USYRT CHIP TYPE
                                        ;*       REQUIRES DECREMENTING THE NO. OF CYCLES BY 1.
                                        ;*********************************************************************************
005254  010146                  STPLU:  MOV     R1,-(SP)        ;SAVE R1
005256  017601  000002                  MOV     @2(SP),R1       ;GET DESIRED NO. OF CYCLES
005262  001426                          BEQ     6$              ;IF DESIRED CYCLES = 0, RETURN
005264  100006                          BPL     2$              ;BR IF CHIP TYPE CHECK NOT NECESSARY
005266  042701  100000                  BIC     #BIT15,R1       ;CLEAR FLAG BIT
005272  005737  002430                  TST     CHPTYP          ;SEE IF SIG USYRT
005276  001401                          BEQ     2$              ;BR IF YES
005300  005301                          DEC     R1              ;DECREMENT CYCLE COUNT
005302  152777  000010  175140  2$:     BISB    #LULOOP,@BSEL1  ;SET LU LOOP BIT
005310  152777  000020  175132  3$:     BISB    #STEPLU,@BSEL1  ;SET THE STEPLU BIT (CLOCK THE TRANSMITTER)
005316  004737  005164                  JSR     PC,STALL        ;STALL
005322  142777  000020  175120          BICB    #STEPLU,@BSEL1  ;CLEAR THE STEPLU BIT (CLOCK THE RECEIVER)
005330  004737  005164                  JSR     PC,STALL        ;STALL
005334  005301                          DEC     R1              ;DECREMENT CYCLE COUNTER
005336  001364                          BNE     3$              ;BR IF NOT DONE YET
005340  062766  000002  000002  6$:     ADD     #2,2(SP)        ;FIX UP RETURN PC
005346  012601                          MOV     (SP)+,R1        ;RESTORE R1
005350  000207                          RTS     PC              ;RETURN
```

```
                        ;*************************************************************************
                        ;* OACTIV - THIS SUBROUTINE CHECKS FOR THE PROPER STATE OF OACT (REG 11) AND
                        ;*      REPORTS AN ERROR IF IT IS NOT PROPERLY SET TO THE STATE OF BIT 0 IN THE
                        ;*      WORD FOLLOWING THE CALL.
                        ;*************************************************************************
005352  013746  002400        OACTIV: MOV     REGNUM,-(SP)    ;SAVE LU REG NO.
005356  013746  002352                MOV     SUBRPC,-(SP)
005362  005737  002352                TST     SUBRPC          ;SEE IF THIS IS A NESTED CALL
005366  001006                        BNE     1$              ;BR IF YES
005370  016637  000004  002352        MOV     4(SP),SUBRPC
005376  162737  000004  002352        SUB     #4,SUBRPC       ;GET PC OF SUBROUTINE CALL
005404  012737  000011  002400  1$:   MOV     #11,REGNUM      ;SET REG NO. = 11
005412  004737  003672                JSR     PC,READLU       ;READ REG 11
005416  032776  000001  000004        BIT     #BIT0,@4(SP)    ;GET EXPECTED STATE OF OACT
005424  001413                        BEQ     3$              ;BR IF EXPECTED OACT = 0
005426  132737  000100  002364        BITB    #OACT,REDBYT    ;SEE IF OACT = 1
005434  001031                        BNE     9$              ;BR IF OACT = 1
005436  004737  004526                JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                        ;REPORT OACT NOT SET
005442                                ERRDF   11,EM11,ERR4
005442  104455                                                                    TRAP    C$ERDF
005444  000013                                                                    .WORD   11
005446  012470                                                                    .WORD   EM11
005450  015622                                                                    .WORD   ERR4
005452  000412                        BR      6$              ;TAKE ERROR RETURN
005454  132737  000100  002364  3$:   BITB    #OACT,REDBYT    ;SEE IF OACT = 0
005462  001416                        BEQ     9$              ;BR IF OACT = 0
005464  004737  004526                JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                        ;REPORT OACT NOT CLEARED
005470                                ERRDF   12,EM12,ERR4
005470  104455                                                                    TRAP    C$ERDF
005472  000014                                                                    .WORD   12
005474  012505                                                                    .WORD   EM12
005476  015622                                                                    .WORD   ERR4
005500  016637  000002  002400  6$:   MOV     2(SP),REGNUM    ;RESTORE LU REG NO.
005506  013706  002346                MOV     PSTACK,SP       ;RESTORE PROGRAM STACK TO BASE LEVEL
005512  013746  002362                MOV     RETADR,-(SP)    ;FIX UP ERROR RETURN PC
005516  000407                        BR      12$
005520  062766  000002  000004  9$:   ADD     #2,4(SP)        ;FIX UP ERROR-FREE RETURN PC
005526  012637  002352                MOV     (SP)+,SUBRPC
005532  012637  002400                MOV     (SP)+,REGNUM    ;RESTORE LU REG NO.
005536  000207                12$:    RTS     PC              ;RETURN


                        ;*************************************************************************
                        ;* INITRN - THIS SUBROUTINE INITIATES TRANSMISSION OF A MESSAGE, BY DOING A
                        ;*      MASTER CLEAR, LOADING AX2-15 AND REG 17 WITH THE DATA PASSED IN THE 2
                        ;*      WORDS FOLLOWING THE CALL, LOADING 2 SOM CHARS INTO THE TX SILO, AND
                        ;*      CLOCKING THE LINE UNIT UNTIL THE FIRST SYNCH OR FLAG HAS BEEN SERIALIZED
                        ;*      IN THE USYRT. THE PROGRAM MONITORS ORDY,OCOR, AND OACT FOR VALID STATES,
                        ;*      THROUGHOUT THE PROCESS.
```

```
                                        ;*      IF THE SUBROUTINE DETECTS AN ERROR, A RETURN IS MADE TO THE TEST, AT THE
                                        ;*      ADDRESS CONTAINED IN RETADR.
                                        ;*****************************************************************************
005540  010146                  INITRN: MOV     R1,-(SP)        ;SAVE R1
005542  013746  002400                  MOV     REGNUM,-(SP)    ;SAVE LU REG NO.
005546  013746  002402                  MOV     AXNUM,-(SP)     ;SAVE AX BYTE NO.
005552  016637  000006  002352          MOV     6(SP),SUBRPC
005560  162737  000004  002352          SUB     #4,SUBRPC       ;GET PC OF SUBR CALL
005566  004737  003576                  JSR     PC,MSTCLR       ;ISSUE A MASTER CLEAR
005572  004737  004662                  JSR     PC,OSIRDY       ;CHECK ORDY=1, OCOR=0
005576  000001                          1
005600  004737  005352                  JSR     PC,OACTIV       ;CHK OACT=0
005604  000000                          0
005606  012737  000004  002402          MOV     #4,AXNUM        ;SET AX BYTE NO. = 4 FOR AX2
005614  117637  000006  002374          MOVB    @6(SP),WAX15    ;SET DATA BYTE TO LOAD INTO AX2-15
005622  012737  000400  002422          MOV     #TXSOM,TXWORD   ;SET TSOM BIT
005630  113737  002374  002422          MOVB    WAX15,TXWORD    ;SET SYNCH CHAR
005636  005037  002376                  CLR     WAX16
005642  004737  004312                  JSR     PC,WRITAX       ;LOAD AX2
005646  012737  000017  002400          MOV     #17,REGNUM      ;SET REG NO. = 17
005654  062766  000002  000006          ADD     #2,6(SP)        ;INCR POINTER TO NEXT DATA BYTE
005662  117637  000006  002366          MOVB    @6(SP),WRIBYT   ;SET DATA BYTE TO LOAD INTO REG 17
005670  004737  003750                  JSR     PC,WRITLU       ;LOAD REG 17
005674  004737  005174                  JSR     PC,LDTXSI       ;LOAD THE SILO WITH SOM CHAR
005700  004737  005174                  JSR     PC,LDTXSI       ;LOAD ANOTHER SOM INTO SILO
005704  004737  005146                  JSR     PC,WAIT50       ;WAIT FOR DATA TO RIPPLE
005710  004737  004662                  JSR     PC,OSIRDY       ;CHK ORDY=1, OCOR=1
005714  000003                          3
005716  004737  005352                  JSR     PC,OACTIV       ;CHK FOR OACT = 0
005722  000000                          0
005724  005001                          CLR     R1              ;INIT CYCLE COUNTER
005726  012737  000011  002400          MOV     #11,REGNUM      ;SET LU REG NO. = 11
005734  152777  000010  174506  6$:     BISB    #LULOOP,@BSEL1  ;SET LINE UNIT LOOP BIT
005742  152777  000020  174500          BISB    #STEPLU,@BSEL1  ;SET CLOCK BIT
005750  004737  005164                  JSR     PC,STALL        ;STALL FOR MICRO-SEC
005754  004737  003672                  JSR     PC,READLU       ;READ REG 11
005760  132737  000100  002364          BITB    #OACT,REDBYT    ;SEE IF OACT = 1 YET
005766  001014                          BNE     9$              ;BR IF OACT = 1
005770  142777  000020  174452          BICB    #STEPLU,@BSEL1  ;CLEAR CLOCK BIT
005776  004737  005164                  JSR     PC,STALL        ;STALL FOR A MICRO-SEC
006002  005201                          INC     R1              ;INCR CYCLE COUNT
006004  020127  000003                  CMP     R1,#3           ;SEE IF 3 CYCLES DONE YET
006010  002751                          BLT     6$              ;BR IF NOT
006012  004737  005352                  JSR     PC,OACTIV       ;CHK FOR OACT = 1
006016  000001                          1
006020  012737  000017  002400  9$:     MOV     #17,REGNUM      ;SET REG NO. = 17
006026  005037  002430                  CLR     CHPTYP          ;CLEAR USYRT CHIP INDICATOR
006032  004737  003672                  JSR     PC,READLU       ;READ REG 17
006036  132737  000020  002364          BITB    #OCOR,REDBYT    ;CHK FOR OCOR CLEARED YET
006044  001403                          BEQ     12$             ;BR IF YES - IT IS SIG CHIP
006046  012737  000001  002430          MOV     #1,CHPTYP       ;SET INDICATOR FOR OTHER CHIP TYPE
006054  142777  000020  174366  12$:    BICB    #STEPLU,@BSEL1  ;CLEAR CLOCK BIT
006062  004737  005164                  JSR     PC,STALL        ;STALL FOR MICRO-SEC
006066  004737  004662                  JSR     PC,OSIRDY       ;CHK FOR ORDY = 1, OCOR = 0
006072  000001                          1
006074  062766  000002  000006          ADD     #2,6(SP)        ;FIX UP RETURN PC
006102  012637  002402                  MOV     (SP)+,AXNUM     ;RESTORE AX BYTE NO.
```

```
                                                MOV     (SP)+,REGNUM    ;RESTORE LU REG NO.
                                                MOV     (SP)+,R1        ;RESTORE R1
                                                CLR     SUBRPC          ;CLEAR SUBR CALL PC
                                                RTS     PC              ;RETURN


                        ;*************************************************************************
                        ;* TXCHAR - THIS SUBROUTINE INITIATES TRANSMISSION OF A CHARACTER, BY LOADING
                        ;*      THE TX SILO WITH DATA PASSED IN BITS 0-11 OF THE WORD FOLLOWING THE CALL
                        ;*      AND CLOCKS THE LINE UNIT WITH THE NUMBER OF CYCLES PASSED IN BITS 0-14
                        ;*      OF THE SECOND WORD FOLLOWING THE CALL. IF BIT 15 = 1, A CHK IS MADE TO
                        ;*      DETERMINE IF THE USYRT CHIP TYPE REQUIRES DECREMENTING THE NO. OF CYCLES
                        ;*      BY 1. THE PROGRAM CHECKS FOR VALID STATES OF ORDY,
                        ;*      OCOR, AND OACT THROUGHOUT THE PROCESS.
                        ;*      IF AN ERROR IS DETECTED, A RETURN IS MADE TO THE TEST, AT THE ADDRESS
                        ;*      CONTAINED IN RETADR.
                        ;*************************************************************************
                        TXCHAR: MOV     R1,-(SP)        ;SAVE R1
                                MOV     R2,-(SP)        ;SAVE R2
                                MOV     4(SP),SUBRPC
                                SUB     #4,SUBRPC       ;GET PC OF SUBR CALL
                                MOV     @4(SP),TXWORD   ;GET DATA TO BE TRANSMITTED
                                JSR     PC,LDTXSI       ;LOAD THE TX SILO WITH THE DATA
                                JSR     PC,WAIT50       ;WAIT FOR DATA TO RIPPLE DOWN SILO
                                ADD     #2,4(SP)        ;INCR POINTER
                                CLR     R1              ;INIT CYCLE COUNT
                                MOV     @4(SP),R2       ;GET DESIRED NO. OF CYCLES
                                TST     R2              ;SEE IF CHIP TYPE CHK SHOULD BE MADE
                                BPL     9$              ;BR IF NOT
                                BIC     #BIT15,R2       ;CLEAR FLAG BIT
                                TST     CHPTYP          ;SEE IF SIG USYRT
                                BEQ     9$              ;BR IF YES
                                DEC     R2              ;DECREMENT NO. OF CYCLES
                        9$:     JSR     PC,OACTIV       ;CHK OACT = 1
                                1
                                CMP     R1,R2           ;SEE IF REQUIRED CYCLES DONE YET
                                BEQ     12$             ;BR IF YES
                                JSR     PC,OSIRDY       ;CHK ORDY=1, OCOR=1
                                3
                                JSR     PC,STPLU        ;STEP LU ONE CYCLE
                                1
                                INC     R1              ;INCR CYCLE COUNT
                                BR      9$
                        12$:    JSR     PC,OSIRDY       ;CHK ORDY=1, OCOR=0
                                1
                                ADD     #2,4(SP)        ;FIX UP RETURN PC
                                CLR     SUBRPC          ;CLEAR SUBR CALL PC
                                MOV     (SP)+,R2        ;RESTORE R2
                                MOV     (SP)+,R1        ;RESTORE R1
                                RTS     PC              ;RETURN
```

```
                                ;*************************************************************************
                                ;* ENDTRN - THIS SUBROUTINE CLEARS THE TRANSMITTER BY SETTING OC. THE PROGRAM
                                ;*      WAITS FOR 50 US, AND CHECKS FOR ORDY=1, OCOR=0, OACT=0, RTS=0.
                                ;*************************************************************************
006274  010146                ENDTRN: MOV     R1,-(SP)        ;SAVE R1
006276  013746  002400                MOV     REGNUM,-(SP)    ;SAVE LU REG NO.
006302  016637  000004  002352        MOV     4(SP),SUBRPC
006310  162737  000004  002352        SUB     #4,SUBRPC       ;GET PC OF SUBROUTINE CALL
006316  012737  000011  002400        MOV     #11,REGNUM      ;SET LU REG NO. = 11
006324  012737  000200  002366        MOV     #OC,WRIBYT      ;SET OC IN DATA
006332  004737  003750                JSR     PC,WRITLU       ;SET OC IN REG 11
006336  004737  005146                JSR     PC,WAIT50       ;STALL FOR >50 US.
006342  004737  004662                JSR     PC,OSIRDY       ;CHK ORDY=1, OCOR=0
006346  000001                        1
006350  004737  005352                JSR     PC,OACTIV       ;CHK OACT = 0
006354  000000                        0
006356  012737  000013  002400        MOV     #13,REGNUM      ;SET REG NO. = 13
006364  004737  003672                JSR     PC,READLU       ;READ REG 13
006370  032737  000040  002364        BIT     #RTS,REDBYT     ;CHK FOR RTS = 0
006376  001406                        BEQ     3$              ;BR IF RTS = 0
006400  004737  004526                JSR     PC,GETAIL       ;GET REGS FOR PRINTOUT
                                ;REPORT RTS NOT CLEARED
006404                                  ERRDF   65,EM65,ERR4
006404  104455                                                                  TRAP    C$ERDF
006406  000101                                                                  .WORD   65
006410  014244                                                                  .WORD   EM65
006412  015622                                                                  .WORD   ERR4
006414  005037  002352          3$:     CLR     SUBRPC          ;CLEAR SUBR CALL PC
006420  012637  002400                  MOV     (SP)+,REGNUM    ;RESTORE LU REG NO.
006424  012601                        MOV     (SP)+,R1        ;RESTORE R1
006426  000207                        RTS     PC              ;RETURN
```

```
                                ;*************************************************************************
                                ;* ISIRDY - THIS SUBROUTINE CHECKS FOR THE PROPER STATES OF ICIR (REG 17)
                                ;*      AND IRDY (REG 12) AND REPORTS AN ERROR IF EITHER IS NOT PROPERLY SET
                                ;*      AS PASSED IN BIT 0 (ICIR) AND BIT 1 (IRDY) OF THE WORD FOLLOWING THE
                                ;*      CALL.
                                ;*      IF AN ERROR OCCURS, A RETURN IS MADE TO THE TEST AT THE ADDRESS
                                ;*      IN RETADR.
                                ;*************************************************************************
006430  013746  002400        ISIRDY: MOV     REGNUM,-(SP)    ;SAVE LU REG NO.
006434  013746  002352                MOV     SUBRPC,-(SP)
006440  005737  002352                TST     SUBRPC          ;SEE IF THIS IS A NESTED CALL
006444  001006                        BNE     1$              ;BR IF YES
006446  016637  000004  002352        MOV     4(SP),SUBRPC
006454  162737  000004  002352        SUB     #4,SUBRPC       ;GET PC OF SUBR CALL
006462  012737  000012  002400  1$:   MOV     #12,REGNUM      ;SET REG NO. TO 12
006470  004737  003672                JSR     PC,READLU       ;READ REG 12
006474  032776  000002  000004        BIT     #BIT1,@4(SP)    ;GET EXPECTED STATE OF IRDY
006502  001413                        BEQ     3$              ;BR IF EXPECTED IRDY = 0
006504  132737  000020  002364        BITB    #IRDY,REDBYT    ;SEE IF IRDY = 1
006512  001022                        BNE     9$              ;BR IF IRDY = 1
```

```
                                                JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                                ;REPORT IRDY NOT SET
                                                ERRDF   17,EM17,ERR4
006520  104455                                                                    TRAP    C$ERDF
006522  000021                                                                    .WORD   17
006524  012643                                                                    .WORD   EM17
006526  015622                                                                    .WORD   ERR4
                                                BR      16$             ;TAKE ERROR EXIT
006532  132737  000020  002364  3$:     BITB    #IRDY,REDBYT    ;SEE IF IRDY = 0
006540  001407                                  BEQ     9$              ;BR IF IRDY = 0
006542  004737  004526                          JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                                ;REPORT IRDY NOT CLEARED
                                                ERRDF   18,EM18,ERR4
006546  104455                                                                    TRAP    C$ERDF
006550  000022                                                                    .WORD   18
006552  012660                                                                    .WORD   EM18
006554  015622                                                                    .WORD   ERR4
006556  000436                                  BR      16$             ;TAKE ERROR RETURN
006560  012737  000017  002400  9$:     MOV     #17,REGNUM      ;SET REG NO. = 17
006566  004737  003672                          JSR     PC,READLU       ;READ REG 17
006572  132776  000001  000004                  BITB    #BIT0,@4(SP)    ;GET EXPECTED STATE OF ICIR
006600  001413                                  BEQ     12$             ;BR IF EXPECTED ICIR = 0
006602  132737  000010  002364                  BITB    #ICIR,REDBYT    ;SEE IF ICIR = 1
006610  001031                                  BNE     20$             ;BR IF ICIR = 1
006612  004737  004526                          JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                                ;REPORT ICIR NOT SET
                                                ERRDF   19,EM19,ERR4
006616  104455                                                                    TRAP    C$ERDF
006620  000023                                                                    .WORD   19
006622  012701                                                                    .WORD   EM19
006624  015622                                                                    .WORD   ERR4
006626  000412                                  BR      16$             ;TAKE ERROR RETURN
006630  132737  000010  002364  12$:     BITB    #ICIR,REDBYT    ;SEE IF ICIR = 0
006636  001416                                  BEQ     20$             ;BR IF ICIR = 0
006640  004737  004526                          JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                                ;REPORT ICIR NOT CLEARED
                                                ERRDF   20,EM20,ERR4
006644  104455                                                                    TRAP    C$ERDF
006646  000024                                                                    .WORD   20
006650  012716                                                                    .WORD   EM20
006652  015622                                                                    .WORD   ERR4
006654  016637  000002  002400  16$:     MOV     2(SP),REGNUM    ;RESTORE LU REG NO.
006662  013706  002346                          MOV     PSTACK,SP       ;RESTORE STACK POINTER TO BASE LEVEL
006666  013746  002362                          MOV     RETADR,-(SP)    ;FIX ERROR RETURN PC
006672  000407                                  BR      23$
006674  062766  000002  000004  20$:     ADD     #2,4(SP)        ;FIX UP ERROR-FREE RETURN PC
006702  012637  002352                          MOV     (SP)+,SUBRPC
006706  012637  002400                          MOV     (SP)+,REGNUM    ;RESTORE LU REG NO.
006712  000207                        23$:     RTS     PC              ;RETURN


                                ;*******************************************************************************
                                ;* IACTIV - THIS SUBROUTINE CHECKS FOR THE PROPER STATE OF IACT (REG 12) AND
                                ;*      REPORTS AN ERROR IF IT IS NOT PROPERLY SET TO THE STATE OF BIT 0 IN THE
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                                        ;*      WORD FOLLOWING THE CALL.
                                        ;*      IF AN ERROR OCCURS, A RETURN IS MADE TO THE TEST AT THE ADDRESS IN
                                        ;*      RETADR.
                                        ;*****************************************************************************
006714  013746  002400          IACTIV: MOV     REGNUM,-(SP)    ;SAVE LU REG NO.
006720  013746  002352                  MOV     SUBRPC,-(SP)
006724  005737  002352                  TST     SUBRPC          ;SEE IF THIS IS A NESTED CALL
006730  001006                          BNE     1$              ;BR IF YES
006732  016637  000004  002352          MOV     4(SP),SUBRPC
006740  162737  000004  002352          SUB     #4,SUBRPC       ;GET PC OF SUBR CALL
006746  012737  000012  002400  1$:     MOV     #12,REGNUM      ;SET REG NO. = 12
006754  004737  003672                  JSR     PC,READLU       ;READ REG 12
006760  032776  000001  000004          BIT     #BIT0,@4(SP)    ;GET EXPECTED STATE OF IACT
006766  001413                          BEQ     3$              ;BR IF EXPECTED IACT = 0
006770  132737  000100  002364          BITB    #IACT,REDBYT    ;SEE IF IACT = 1
006776  001031                          BNE     9$              ;BR IF IACT = 1
007000  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                                ;REPORT IACT NOT SET
007004                                  ERRDF   21,EM21,ERR4
007004  104455                                                                  TRAP    C$ERDF
007006  000025                                                                  .WORD   21
007010  012737                                                                  .WORD   EM21
007012  015622                                                                  .WORD   ERR4
007014  000412                          BR      6$              ;TAKE ERROR EXIT
007016  132737  000100  002364  3$:     BITB    #IACT,REDBYT    ;SEE IF IACT = 0
007024  001416                          BEQ     9$              ;BR IF IACT = 0
007026  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                                ;REPORT IACT NOT CLEARED
007032                                  ERRDF   22,EM22,ERR4
007032  104455                                                                  TRAP    C$ERDF
007034  000026                                                                  .WORD   22
007036  012754                                                                  .WORD   EM22
007040  015622                                                                  .WORD   ERR4
007042  016637  000002  002400  6$:     MOV     2(SP),REGNUM    ;RESTORE LU REG NO.
007050  013706  002346                  MOV     PSTACK,SP       ;RESTORE PROGRAM STACK TO BASE LEVEL
007054  013746  002362                  MOV     RETADR,-(SP)    ;FIX UP ERROR RETURN PC
007060  000407                          BR      12$
007062  062766  000002  000004  9$:     ADD     #2,4(SP)        ;FIX UP ERROR-FREE RETURN PC
007070  012637  002352                  MOV     (SP)+,SUBRPC
007074  012637  002400                  MOV     (SP)+,REGNUM    ;RESTORE LU REG NO.
007100  000207                  12$:    RTS     PC              ;RETURN


                                        ;*****************************************************************************
                                        ;* RSEOM - THIS SUBROUTINE CHECKS FOR THE PROPER STATES OF RSOM AND REOM IN
                                        ;* AX0-16, AND REPORTS AN ERROR IF EITHER IS NOT SET TO THE STATE PASSED IN BITS
                                        ;* 0,1, RESPECTIVELY, OF THE WORD FOLLOWING THE CALL.
                                        ;* IF AN ERROR OCCURS, A RETURN IS MADE TO THE TEST AT THE ADDRESS IN RETADR.
                                        ;*****************************************************************************
007102  013746  002402          RSEOM:  MOV     AXNUM,-(SP)     ;SAVE AX BYTE NO.
007106  013746  002352                  MOV     SUBRPC,-(SP)
007112  005737  002352                  TST     SUBRPC          ;SEE IF THIS IS A NESTED CALL
007116  001006                          BNE     1$              ;BR IF YES
007120  016637  000004  002352          MOV     4(SP),SUBRPC
```

```
                                                                                                                    
  690 007126  162737  000004  002352          SUB     #4,SUBRPC       ;GET PC OF SUBR CALL
  691 007134  012737  000001  002402  1$:     MOV     #1,AXNUM        ;SET AX BYTE NO. FOR AX0-16
  692 007142  004737  004124                  JSR     PC,READAX       ;READ AX0
  693 007146  032776  000001  000004          BIT     #BIT0,@4(SP)    ;GET EXPECTED STATE OF RSOM
  694 007154  001413                          BEQ     3$              ;BR IF EXPECTED RSOM = 0
  695 007156  132737  000001  002372          BITB    #RSOM,RAX16     ;SEE IF RSOM = 1
  696 007164  001022                          BNE     9$              ;BR IF RSOM = 1
  697 007166  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
  698                             ;REPORT RSOM NOT SET
  699 007172                                  ERRDF   29,EM29,ERR6
      007172  104455                                                                      TRAP    C$ERDF
      007174  000035                                                                      .WORD   29
      007176  013173                                                                      .WORD   EM29
      007200  017012                                                                      .WORD   ERR6
  700 007202  000444                          BR      16$             ;TAKE ERROR EXIT
  701 007204  132737  000001  002372  3$:     BITB    #RSOM,RAX16     ;SEE IF RSOM = 0
  702 007212  001407                          BEQ     9$              ;BR IF RSOM = 0
  703 007214  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
  704                             ;REPORT RSOM NOT CLEARED
  705 007220                                  ERRDF   28,EM28,ERR6
      007220  104455                                                                      TRAP    C$ERDF
      007222  000034                                                                      .WORD   28
      007224  013152                                                                      .WORD   EM28
      007226  017012                                                                      .WORD   ERR6
  706 007230  000431                          BR      16$             ;TAKE ERROR RETURN
  707 007232  132776  000002  000004  9$:     BITB    #BIT1,@4(SP)    ;GET EXPECTED STATE OF REOM
  708 007240  001413                          BEQ     12$             ;BR IF EXPECTED REOM = 0
  709 007242  132737  000002  002372          BITB    #REOM,RAX16     ;SEE IF REOM = 1
  710 007250  001031                          BNE     20$             ;BR IF REOM = 1
  711 007252  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
  712                             ;REPORT REOM NOT SET
  713 007256                                  ERRDF   31,EM31,ERR6
      007256  104455                                                                      TRAP    C$ERDF
      007260  000037                                                                      .WORD   31
      007262  013231                                                                      .WORD   EM31
      007264  017012                                                                      .WORD   ERR6
  714 007266  000412                          BR      16$             ;TAKE ERROR RETURN
  715 007270  132737  000002  002372  12$:    BITB    #REOM,RAX16     ;SEE IF REOM = 0
  716 007276  001416                          BEQ     20$             ;BR IF REOM = 0
  717 007300  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
  718                             ;REPORT REOM NOT CLEARED
  719 007304                                  ERRDF   30,EM30,ERR6
      007304  104455                                                                      TRAP    C$ERDF
      007306  000036                                                                      .WORD   30
      007310  013210                                                                      .WORD   EM30
      007312  017012                                                                      .WORD   ERR6
  720 007314  016637  000002  002402  16$:     MOV     2(SP),AXNUM     ;RESTORE AX BYTE NO.
  721 007322  013706  002346                  MOV     PSTACK,SP       ;RESTORE STACK POINTER TO BASE LEVEL
  722 007326  013746  002362                  MOV     RETADR,-(SP)    ;FIX ERROR RETURN PC
  723 007332  000407                          BR      23$
  724 007334  062766  000002  000004  20$:     ADD     #2,4(SP)        ;FIX UP ERROR-FREE RETURN PC
  725 007342  012637  002352                  MOV     (SP)+,SUBRPC
  726 007346  012637  002402                  MOV     (SP)+,AXNUM     ;RESTORE AX BYTE NO.
  727 007352  000207                  23$:    RTS     PC              ;RETURN
  728
  729
  730
```

```
                                        ;*****************************************************************************
                                        ;* RDRXSI - THIS SUBROUTINE READS THE RCV SILO (REGS 10,12) AND RETURNS THE
                                        ;*      SILO ENTRY IN BITS 0-11 OF RXWORD.
                                        ;*****************************************************************************
007354  013746  002400          RDRXSI: MOV     REGNUM,-(SP)    ;SAVE LU REG NO.
007360  012737  000012  002400          MOV     #12,REGNUM      ;SET REG NO. = 12
007366  004737  003672                  JSR     PC,READLU       ;READ LU REG 12
007372  113737  002364  002425          MOVB    REDBYT,RXWORD+1 ;GET HI BITS OF SILO ENTRY
007400  042737  170000  002424          BIC     #170000,RXWORD  ;CLEAR UNUSED BITS
007406  012737  000010  002400          MOV     #10,REGNUM      ;SET REG NO. = 10
007414  004737  003672                  JSR     PC,READLU       ;READ REG 10
007420  113737  002364  002424          MOVB    REDBYT,RXWORD   ;GET LOW BITS OF SILO ENTRY
007426  012637  002400                  MOV     (SP)+,REGNUM    ;RESTORE LU REG NO.
007432  000207                          RTS     PC              ;RETURN


                                        ;*****************************************************************************
                                        ;* RCV1ST - THIS SUBROUTINE RECEIVES THE FIRST CHAR OF A MESSAGE, AND MONITORS
                                        ;*      STATUS OF THE RECEIVER. FIRST, A CHECK IS MADE FOR IACT = 0, IRDY = 0,
                                        ;*      ICIR = 1, AND RSOM = 0. THEN, THE LINE UNIT IS CLOCKED USING
                                        ;*      STEPLU UNTIL IRDY = 1. THE PROGRAM CHECKS FOR THIS TO OCCUR WITHIN 3
                                        ;*      CYCLES AFTER THE NO. OF CYCLES PASSED IN THE WORD FOLLOWING THE CALL.
                                        ;*      IF AN ERROR OCCURS, A RETURN IS MADE TO THE TEST, AT THE ADDRESS
                                        ;*      CONTAINED IN RETADR.
                                        ;*****************************************************************************
007434  010146                  RCV1ST: MOV     R1,-(SP)        ;SAVE R1
007436  010346                          MOV     R3,-(SP)        ;SAVE R3
007440  013746  002400                  MOV     REGNUM,-(SP)    ;SAVE LU REG NO.
007444  016637  000006  002352          MOV     6(SP),SUBRPC
007452  162737  000004  002352          SUB     #4,SUBRPC       ;GET PC OF SUBROUTINE CALL
007460  012737  000012  002400          MOV     #12,REGNUM      ;SET LU REG NO. = 12
007466  005001                          CLR     R1              ;INIT CYCLE COUNT TO 0
007470  017603  000006                  MOV     @6(SP),R3       ;GET CYCLE COUNT LIMIT
007474  062703  000003                  ADD     #3,R3
007500  005776  000006                  TST     @6(SP)          ;SEE IF DESIRED CYCLES = 0
007504  001414                          BEQ     8$              ;BR IF YES
007506  004737  006714                  JSR     PC,IACTIV       ;CHK FOR IACT = 0
007512  000000                          0
007514  004737  006430                  JSR     PC,ISIRDY       ;CHK FOR ICIR = 1, IRDY = 0
007520  000001                          1
007522  004737  007102                  JSR     PC,RSEOM        ;CHK RSOM = 0, REOM = 0 IN AX0-16
007526  000000                          0
007530  004737  005254          6$:     JSR     PC,STPLU        ;CLOCK LU FOR 1 CYCLE
007534  000001                          1
007536  004737  005146          8$:     JSR     PC,WAIT50       ;ALLOW SILO DATA TO RIPPLE
007542  005201                          INC     R1              ;INCREMENT CYCLE COUNT
007544  004737  003672                  JSR     PC,READLU       ;READ REG 12
007550  132737  000020  002364          BITB    #IRDY,REDBYT    ;SEE IF IRDY = 1 YET
007556  001005                          BNE     9$              ;BR IF IRDY = 1
007560  020103                          CMP     R1,R3           ;SEE IF LIMIT EXCEEDED
007562  002762                          BLT     6$              ;BR IF NOT YET
007564  004737  006430                  JSR     PC,ISIRDY       ;CHK FOR ICIR = 1, IRDY = 1
```

```
 788 007570  000003                        3
 789 007572  020176  000006          9$:   CMP     R1,@6(SP)       ;SEE IF LESS THAN REQUIRED CYCLES
 790 007576  002003                        BGE     12$             ;BR IF NOT
 791 007600  004737  006430                JSR     PC,ISIRDY       ;CHK FOR ICIR = 1, IRDY = 0
 792 007604  000001                        1
 793 007606  004737  006714          12$:  JSR     PC,IACTIV       ;CHK FOR IACT = 1
 794 007612  000001                        1
 795 007614  004737  006430                JSR     PC,ISIRDY       ;CHK FOR ICIR = 1, IRDY = 1
 796 007620  000003                        3
 797 007622  062766  000002  000006        ADD     #2,6(SP)        ;FIX UP RETURN PC
 798 007630  012637  002400                MOV     (SP)+,REGNUM    ;RESTORE LU REG NO.
 799 007634  012603                        MOV     (SP)+,R3        ;RESTORE R3
 800 007636  012601                        MOV     (SP)+,R1        ;RESTORE R1
 801 007640  005037  002352                CLR     SUBRPC          ;CLEAR SUBR CALL PC
 802 007644  000207                        RTS     PC              ;RETURN
 803
 804
 805
 806
 807
 808                                ;*****************************************************************************
 809                                ;* STPERR - THIS SUBROUTINE LOADS THE CONTENTS OF THE FIRST WORD FOLLOWING THE
 810                                ;*      CALL INTO REG 17, AND SETS THE IERR BIT, AND CLOCKS THE LINE UNIT
 811                                ;*      FOR THE NO. OF CYCLES PASSED IN THE 2ND WORD FOLLOWING THE CALL. THEN,
 812                                ;*      IT RESTORES REG 17 TO ITS ORIGINAL CONTENTS, CLEARING THE IERR BIT.
 813                                ;*****************************************************************************
 814 007646  013746  002400        STPERR: MOV     REGNUM,-(SP)    ;SAVE LU REG NO.
 815 007652  012737  000017  002400        MOV     #17,REGNUM      ;SET LU REG NO. = 17
 816 007660  017637  000002  002366        MOV     @2(SP),WRIBYT
 817 007666  152737  000002  002366        BISB    #IERR,WRIBYT
 818 007674  004737  003750                JSR     PC,WRITLU       ;SET IERR BIT IN REG 17
 819 007700  062766  000002  000002        ADD     #2,2(SP)        ;INCREMENT SUBR ARGUMENT POINTER
 820 007706  017637  000002  007720        MOV     @2(SP),3$       ;GET DESIRED NO. OF CYCLES
 821 007714  004737  005254                JSR     PC,STPLU        ;CLOCK LU FOR DESIRED NO. OF CYCLES
 822 007720  000000                  3$:   .WORD   0               ;NO. OF CYCLES GOES HERE
 823 007722  142737  000002  002366        BICB    #IERR,WRIBYT
 824 007730  004737  003750                JSR     PC,WRITLU       ;CLEAR IERR BIT IN REG 17
 825 007734  062766  000002  000002        ADD     #2,2(SP)        ;FIX UP RETURN PC
 826 007742  012637  002400                MOV     (SP)+,REGNUM    ;RESTORE LU REG NO.
 827 007746  000207                        RTS     PC              ;RETURN
 828
 829
 830
 831
 832
 833                                ;*****************************************************************************
 834                                ;* CKDATA - THIS SUBROUTINE READS THE RCV SILO AND COMPARES THE SILO ENTRY
 835                                ;*      TO BITS 0-11 OF THE FIRST WORD FOLLOWING THE CALL. IF THERE IS A
 836                                ;*      MISMATCH, THE ERROR IS REPORTED AND A RETURN IS MADE TO THE TEST AT THE
 837                                ;*      ADDRESS CONTAINED IN RETADR. IF BIT 15 = 0 IN THE FIRST WORD
 838                                ;*      FOLLOWING THE CALL, THE SUBROUTINE WILL NOT CHECK THE BCC BIT (SILO
 839                                ;*      BIT 8). IF THERE ARE NO ERRORS, THE LINE UNIT IS CLOCKED FOR THE
 840                                ;*      NUMBER OF CYCLES PASSED IN THE SECOND WORD FOLLOWING THE CALL.
 841                                ;*****************************************************************************
 842 007750  010146                CKDATA: MOV     R1,-(SP)        ;SAVE R1
 843 007752  013746  002400                MOV     REGNUM,-(SP)    ;SAVE LU REG NO.
 844 007756  016637  000004  002352        MOV     4(SP),SUBRPC
```

```
                                        SUB     #4,SUBRPC       ;GET PC OF SUBR CALL
                                        MOV     @4(SP),R1       ;GET EXPECTED SILO ENTRY
                                        BIC     #170000,R1      ;CLEAR UNUSED BITS FOR COMPARE
                                        JSR     PC,RDRXSI       ;READ RCV SILO
                                        CMP     SAVLEN,#TXLEN2!TXLEN1!TXLEN0!RXLEN2!RXLEN1:RXLEN0
                                        BNE     4$              ;BR IF CHAR LENGTH NOT = 7
                                        BIC     #BIT7,R1        ;MASK OFF BIT 8TH BIT
                                        BIC     #BIT7,RXWORD
                                4$:     CMPB    R1,RXWORD       ;COMPARE EXPECTED BITS 0-7 TO ACTUAL
                                        BEQ     6$              ;BR IF MATCH
                                        CLR     GOODAT
                                        MOVB    R1,GOODAT       ;GET EXPECTED DATA
                                        CLR     BADDAT
                                        MOVB    RXWORD,BADDAT   ;GET ACTUAL DATA
                                        MOV     #11,REGNUM      ;SET REG NO. = 11
                                        JSR     PC,READLU       ;READ REG 11
                                        BITB    #UNRR,REDBYT    ;SEE IF TX UNDERRUN ERROR
                                        BEQ     5$              ;BR IF NOT
                                        JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                                ;REPORT TX UNDERRUN ERROR
                                        ERRDF   54,EM54,ERR4
010106  104455                                                                 TRAP    C$ERDF
010110  000066                                                                 .WORD   54
010112  014206                                                                 .WORD   EM54
010114  015622                                                                 .WORD   ERR4
010116  000137  010600                    JMP     36$             ;TAKE ERROR EXIT
010122  012737  000010  002400    5$:     MOV     #10,REGNUM      ;SET REG NO. = 10
010130  004737  004526                    JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                                ;REPORT RCV'D DATA MISCOMPARE
                                        ERRDF   34,EM34,ERR8
010134  104455                                                                 TRAP    C$ERDF
010136  000042                                                                 .WORD   34
010140  013320                                                                 .WORD   EM34
010142  020122                                                                 .WORD   ERR8
010144  000137  010600                    JMP     36$             ;TAKE ERROR EXIT
010150  000301                    6$:     SWAB    R1
010152  012737  000012  002400            MOV     #12,REGNUM      ;SET LU REG NO. FOR ERROR REPORTS
010160  120137  002425                    CMPB    R1,RXWORD+1     ;COMPARE EXPECTED SILO BITS 8-11 TO ACTUAL
010164  001002                            BNE     7$              ;BR IF MISMATCH
010166  000137  010554                    JMP     22$             ;CONTINUE
010172  005037  002404            7$:     CLR     GOODAT
010176  110137  002404                    MOVB    R1,GOODAT       ;SET EXPECTED DATA
010202  005037  002406                    CLR     BADDAT
010206  113737  002425  002406            MOVB    RXWORD+1,BADDAT ;SET ACTUAL DATA
010214  032776  100000  000004            BIT     #BCCCHK,@4(SP)  ;SEE IF BCC SHOULD BE IGNORED
010222  001433                            BEQ     10$             ;BR IF YES
010224  132701  000001                    BITB    #BCC,R1         ;SEE IF EXPECTED BIT = 1
010230  001014                            BNE     8$              ;BR IF YES
010232  132737  000001  002425            BITB    #BCC,RXWORD+1   ;SEE IF ACTUAL BIT = 0
010240  001424                            BEQ     10$             ;BR IF YES
010242  004737  004526                    JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                                ;REPORT BCC NOT CLEARED
                                        ERRDF   35,EM35,ERR8
010246  104455                                                                 TRAP    C$ERDF
010250  000043                                                                 .WORD   35
010252  013346                                                                 .WORD   EM35
010254  020122                                                                 .WORD   ERR8
```

```
    890 010256  000137  010600                  JMP     36$             ;TAKE ERROR EXIT
    891 010262  132737  000001  002425  8$:     BITB    #BCC,RXWORD+1   ;SEE IF ACTUAL BIT = 1
    892 010270  001010                          BNE     10$             ;BR IF YES
    893 010272  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
    894                             ;REPORT BCC NOT SET
    895 010276                                  ERRDF   36,EM36,ERR8
        010276  104455                                                              TRAP    C$ERDF
        010300  000044                                                              .WORD   36
        010302  013366                                                              .WORD   EM36
        010304  020122                                                              .WORD   ERR8
    896 010306  000137  010600                  JMP     36$             ;TAKE ERROR EXIT
    897 010312                          10$:
    898 010312  132701  000002                  BITB    #EBLK,R1        ;SEE IF EXPECTED BIT = 1
    899 010316  001014                          BNE     12$             ;BR IF YES
    900 010320  132737  000002  002425          BITB    #EBLK,RXWORD+1  ;SEE IF ACTUAL BIT = 0
    901 010326  001424                          BEQ     14$             ;BR IF YES
    902 010330  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
    903                             ;REPORT EBLK NOT CLEARED
    904 010334                                  ERRDF   37,EM37,ERR8
        010334  104455                                                              TRAP    C$ERDF
        010336  000045                                                              .WORD   37
        010340  013402                                                              .WORD   EM37
        010342  020122                                                              .WORD   ERR8
    905 010344  000137  010600                  JMP     36$             ;TAKE ERROR EXIT
    906 010350  132737  000002  002425  12$:    BITB    #EBLK,RXWORD+1  ;SEE IF ACTUAL BIT = 1
    907 010356  001010                          BNE     14$             ;BR IF YES
    908 010360  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
    909                             ;REPORT EBLK NOT SET
    910 010364                                  ERRDF   38,EM38,ERR8
        010364  104455                                                              TRAP    C$ERDF
        010366  000046                                                              .WORD   38
        010370  013423                                                              .WORD   EM38
        010372  020122                                                              .WORD   ERR8
    911 010374  000137  010600                  JMP     36$             ;TAKE ERROR EXIT
    912 010400                          14$:
    913 010400  132701  000004                  BITB    #RAB,R1         ;SEE IF EXPECTED BIT = 1
    914 010404  001014                          BNE     16$             ;BR IF YES
    915 010406  132737  000004  002425          BITB    #RAB,RXWORD+1   ;SEE IF ACTUAL BIT = 0
    916 010414  001424                          BEQ     18$             ;BR IF YES
    917 010416  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
    918                             ;REPORT RAB NOT CLEARED
    919 010422                                  ERRDF   39,EM39,ERR8
        010422  104455                                                              TRAP    C$ERDF
        010424  000047                                                              .WORD   39
        010426  013440                                                              .WORD   EM39
        010430  020122                                                              .WORD   ERR8
    920 010432  000137  010600                  JMP     36$             ;TAKE ERROR EXIT
    921 010436  132737  000004  002425  16$:    BITB    #RAB,RXWORD+1   ;SEE IF ACTUAL BIT = 1
    922 010444  001010                          BNE     18$             ;BR IF YES
    923 010446  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
    924                             ;REPORT RAB NOT SET
    925 010452                                  ERRDF   40,EM40,ERR8
        010452  104455                                                              TRAP    C$ERDF
        010454  000050                                                              .WORD   40
        010456  013460                                                              .WORD   EM40
        010460  020122                                                              .WORD   ERR8
    926 010462  000137  010600                  JMP     36$             ;TAKE ERROR EXIT
```

```
                                18$:
010466  132701  000010          BITB    #OVRR,R1        ;SEE IF EXPECTED BIT = 1
010472  001014                  BNE     20$             ;BR IF YES
010474  132737  000010  002425  BITB    #OVRR,RXWORD+1  ;SEE IF ACTUAL BIT = 0
010502  001424                  BEQ     22$             ;BR IF YES
010504  004737  004526          JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                                ;REPORT OVRR NOT CLEARED
010510                          ERRDF   41,EM41,ERR8
010510  104455                                                          TRAP    C$ERDF
010512  000051                                                          .WORD   41
010514  013474                                                          .WORD   EM41
010516  020122                                                          .WORD   ERR8
010520  000137  010600          JMP     36$             ;TAKE ERROR EXIT
010524  132737  000010  002425  20$:    BITB    #OVRR,RXWORD+1  ;SEE IF ACTUAL BIT = 1
010532  001010                  BNE     22$             ;BR IF YES
010534  004737  004526          JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                                ;REPORT OVRR NOT SET
010540                          ERRDF   42,EM42,ERR8
010540  104455                                                          TRAP    C$ERDF
010542  000052                                                          .WORD   42
010544  013515                                                          .WORD   EM42
010546  020122                                                          .WORD   ERR8
010550  000137  010600          JMP     36$             ;TAKE ERROR EXIT
010554                          22$:
010554  062766  000002  000004  ADD     #2,4(SP)        ;INCR SUBROUTINE ARGUMENT POINTER
010562  017637  000004  010574  MOV     @4(SP),24$      ;GET DESIRED CYCLE COUNT
010570  004737  005254          JSR     PC,STPLJ        ;CLOCK LU FOR DESIRED CYCLES
010574  000000                  24$:    .WORD   0
010576  000407                  BR      38$             ;TAKE ERROR-FREE EXIT
010600  011637  002400          36$:    MOV     (SP),REGNUM     ;RESTORE LU REG NO.
010604  013706  002346          MOV     PSTACK,SP       ;RESTORE PROGRAM STACK TO BASE LEVEL
010610  013746  002362          MOV     RETADR,-(SP)    ;FIX UP ERROR RETURN PC
010614  000406                  BR      40$
010616  062766  000002  000004  38$:    ADD     #2,4(SP)        ;FIX UP ERROR-FREE RETURN PC
010624  012637  002400          MOV     (SP)+,REGNUM    ;RESTORE LU REG NO.
010630  012601                  MOV     (SP)+,R1        ;RESTORE R1
010632  005037  002352          40$:    CLR     SUBRPC          ;CLEAR SUBROUTINE PC
010636  000207                  RTS     PC              ;RETURN
```

```
                        ;*****************************************************************************
                        ;* SETUP - THIS SUBROUTINE LOADS THE FIRST WORD AFTER THE CALL INTO AX2-15
                        ;*       (SYNCH CHAR), LOADS THE SECOND WORD AFTER THE CALL INTO REG 17
                        ;*       LOADS THE THIRD WORD INTO AX3-15, AND LOADS THE FOURTH INTO AX3-16.
                        ;*****************************************************************************
010640  013746  002402  SETUP:  MOV     AXNUM,-(SP)     ;SAVE AX BYTE NO.
010644  013746  002400          MOV     REGNUM,-(SP)    ;SAVE LU REG NO.
010650  012737  000004  002402  MOV     #4,AXNUM        ;SET AX BYTE NO. FOR AX2
010656  017637  000004  002374  MOV     @4(SP),WAX15
010664  005037  002376          CLR     WAX16
010670  004737  004312          JSR     PC,WRITAX       ;SET SYNCH CHAR IN AX2-15, CLEAR AX2-16
010674  012737  000017  002400  MOV     #17,REGNUM      ;SET LU REG NO. = 17
010702  062766  000002  000004  ADD     #2,4(SP)        ;INCREMENT ARGUMENT POINTER
010710  017637  000004  002366  MOV     @4(SP),WRIBYT
```

```
                                                JSR     PC,WRITLU       ;LOAD REG 17
                                                MOV     #6,AXNUM        ;SET AX BYTE NO. FOR AX3
                                                ADD     #2,4(SP)        ;INCREMENT ARGUMENT POINTER
                                                MOV     @4(SP),WAX15
                                                ADD     #2,4(SP)        ;INCR ARGUMENT POINTER
                                                MOV     @4(SP),WAX16
                                                MOV     WAX16,SAVLEN    ;STORE TX AND RCV CHAR LENGTH
                                                JSR     PC,WRITAX       ;LOAD AX3-15, AX3-16
                                                ADD     #2,4(SP)        ;FIX RETURN PC
                                                MOV     (SP)+,REGNUM    ;RESTORE LU REG NO.
                                                MOV     (SP)+,AXNUM     ;RESTORE AX BYTE NO.
                                                CLR     SUBRPC          ;CLEAR SUBROUTINE PC STORAGE
                                                RTS     PC              ;RETURN


                                        ;*******************************************************************************
                                        ;* LODMSG - THIS SUBROUTINE LOADS THE NO. OF WORDS PASSED IN THE SECOND WORD
                                        ;*      FOLLOWING THE CALL FROM THE MSG BUFFER WHOSE ADDRESS IS IN THE FIRST
                                        ;*      WORD FOLLOWING THE CALL, INTO THE TRANSMITTER SILO.
                                        ;*******************************************************************************
                                        LODMSG: MOV     R1,-(SP)        ;SAVE R1
                                                MOV     R2,-(SP)        ;SAVE R2
                                                MOV     @4(SP),R1       ;GET MSG POINTER INTO R1
                                                ADD     #2,4(SP)        ;INCR ARG POINTER
                                                MOV     @4(SP),R2       ;GET WORD COUNT INTO R2
                                                ADD     #2,4(SP)        ;FIX UP RETURN PC
                                        6$:     MOV     (R1)+,TXWORD    ;GET NEXT MSG WORD
                                                JSR     PC,LDTXSI       ;LOAD A WORD INTO TX SILO
                                                DEC     R2              ;DECR COUNT
                                                BNE     6$              ;BR IF NOT DONE YET
                                                JSR     PC,WAIT50       ;WAIT FOR SILO TO RIPPLE
                                                MOV     (SP)+,R2        ;RESTORE R2
                                                MOV     (SP)+,R1        ;RESTORE R1
                                                RTS     PC              ;RETURN


                                        ;*******************************************************************************
                                        ;* RXCHAR - THIS SUBROUTINE READS THE RCV SILO AND CLOCKS THE LINE UNIT.
                                        ;*      FIRST, IT READS THE CHAR FROM THE RCV SILO, AND CHECKS FOR ICIR
                                        ;*      = 1, IRDY = 0. II THEN CLOCKS THE LINE UNIT FOR THE NO. OF CYCLES
                                        ;*      PASSED IN THE WORD FOLLOWING THE CALL, AND THEN CHECKS FOR ICIR
                                        ;*      = 1, IRDY = 1.
                                        ;*******************************************************************************
                                        RXCHAR: MOV     R1,-(SP)        ;SAVE R1
                                                MOV     2(SP),SUBRPC
                                                SUB     #4,SUBRPC       ;GET PC OF SUBR CALL
                                                JSR     PC,RDRXSI       ;READ RCV SILO
                                                JSR     PC,WAIT50       ;ALLOW SILO TO RIPPLE
                                                CLR     R1              ;INIT CYCLE COUNT
                                        9$:     CMP     R1,@2(SP)       ;SEE IF REQUIRED CYCLES DONE YET
                                                BEQ     12$             ;BR IF YES
```

```
1033 011132  004737  006430                JSR     PC,ISIRDY       ;CHK ICIR = 1, IRDY = 0
1034 011136  000001                        1
1035 011140  004737  005254                JSR     PC,STPLU        ;CLK LU 1 CYCLE
1036 011144  000001                        1
1037 011146  005201                        INC     R1              ;INCR CYCLE COUNT
1038 011150  000765                        BR      9$
1039 011152  004737  006430          12$:  JSR     PC,ISIRDY       ;CHK ICIR = 1 IRDY = 1
1040 011156  000003                        3
1041 011160  062766  000002  000002        ADD     #2,2(SP)        ;FIX RETURN PC
1042 011166  005037  002352                CLR     SUBRPC          ;CLEAR SUBR CALL PC
1043 011172  012601                        MOV     (SP)+,R1        ;RESTORE R1
1044 011174  000207                        RTS     PC              ;RETURN
1045
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1047
1048
1049
1050                                ;*****************************************************************************
1051                                ;* CKTBIT - THIS SUBROUTINE CLOCKS THE LINE UNIT FOR 8 CYCLES, AND AFTER EACH
1052                                ;*      CYCLE, THE TXDATA BIT IN REG 17 IS EXAMINED, AND COMPARED TO A BIT OF
1053                                ;*      THE CHAR PASSED IN THE WORD FOLLOWING THE CALL.
1054                                ;*      IF AN ERROR OCCURS, A RETURN IS MADE TO THE TEST AT THE ADDRESS IN
1055                                ;*      RETADR.
1056                                ;*****************************************************************************
1057 011176  013746  002400          CKTBIT: MOV     REGNUM,-(SP)    ;SAVE LU REG NO.
1058 011202  010146                        MOV     R1,-(SP)        ;SAVE R1
1059 011204  016637  000004  002352        MOV     4(SP),SUBRPC
1060 011212  162737  000004  002352        SUB     #4,SUBRPC       ;GET PC OF SUBROUTINE CALL
1061 011220  012701  000001                MOV     #BIT0,R1        ;INIT BIT POINTER
1062 011224  012737  000017  002400        MOV     #17,REGNUM      ;SET REG NO. = 17
1063 011232  004737  005254          4$:   JSR     PC,STPLU        ;CLOCK LINE UNIT 1 CYCLE
1064 011236  000001                        1
1065 011240  004737  003672                JSR     PC,READLU       ;READ REG 17
1066 011244  030176  000004                BIT     R1,@4(SP)       ;SEE IF EXPECTED BIT = 1
1067 011250  001013                        BNE     9$              ;BR IF YES
1068 011252  132737  000040  002364        BITB    #TXDATA,REDBYT  ;SEE IF ACTUAL BIT = 0
1069 011260  001422                        BEQ     12$             ;BR IF YES
1070 011262  004737  004526                JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
1071                                ;REPORT TXDATA NOT CLEARED
1072 011266                                ERRDF   32,EM32,ERR4
     011266  104455                                                                  TRAP    C$ERDF
     011270  000040                                                                  .WORD   32
     011272  013246                                                                  .WORD   EM32
     011274  015622                                                                  .WORD   ERR4
1073 011276  000420                        BR      20$             ;TAKE ERROR RETURN
1074 011300  132737  000040  002364  9$:   BITB    #TXDATA,REDBYT  ;SEE IF ACTUAL BIT = 1
1075 011306  001007                        BNE     12$             ;BR IF YES
1076 011310  004737  004526                JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
1077                                ;REPORT TXDATA BIT NOT SET
1078 011314                                ERRDF   33,EM33,ERR4
     011314  104455                                                                  TRAP    C$ERDF
     011316  000041                                                                  .WORD   33
     011320  013275                                                                  .WORD   EM33
     011322  015622                                                                  .WORD   ERR4
1079 011324  000405                        BR      20$             ;TAKE ERROR EXIT
1080 011326  006301                12$:   ASL     R1              ;SHIFT BIT POINTER
1081 011330  020127  000400                CMP     R1,#400         ;SEE IF 8 BITS SCANNED YET
```

```
1082 011334  001336                        BNE     4$              ;BR IF NO
1083 011336  000405                        BR      22$
1084 011340  013706  002346          20$:   MOV     PSTACK,SP       ;RESTORE PROGRAM STACK POINTER TO BASE LEVEL
1085 011344  013746  002362                MOV     RETADR,-(SP)    ;FIX UP RETURN PC
1086 011350  000406                        BR      40$
1087 011352  062766  000002  000004  22$:   ADD     #2,4(SP)        ;FIX UP ERROR-FREE RETURN PC
1088 011360  012601                        MOV     (SP)+,R1        ;RESTORE R1
1089 011362  012637  002400                MOV     (SP)+,REGNUM    ;RESTORE REG NO.
1090 011366  005037  002352          40$:   CLR     SUBRPC          ;CLEAR SUBR CALL PC
1091 011372  000207                        RTS     PC              ;RETURN
1092
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1097                                ;*****************************************************************************
1098                                ;* LDMSG1 - THIS SUBROUTINE LOADS THE TRANSMITTER SILO WITH MSG1, AND LOADS
1099                                ;*      THE DATA CHARS INTO THE RCV MSG BUFFER (RCVBUF:), AS EXPECTED DATA
1100                                ;*      FOR LATER COMPARISON.
1101                                ;*****************************************************************************
1102 011374  010146                LDMSG1: MOV     R1,-(SP)        ;SAVE R1
1103 011376  010246                        MOV     R2,-(SP)        ;SAVE R2
1104 011400  004737  011016                JSR     PC,LODMSG       ;LOAD MSG1 INTO TX SILO
1105 011404  003220                        MSG1
1106 011406  000011                        9.
1107 011410  012701  003224                MOV     #MSG1+4,R1      ;GET POINTER TO MSG1
1108 011414  012702  003262                MOV     #RCVBUF,R2      ;GET POINTER TO MSG BUF
1109 011420  012122                3$:     MOV     (R1)+,(R2)+     ;LOAD A CHAR INTO MSG BUF
1110 011422  020127  003236                CMP     R1,#MSG1+14.    ;SEE IF DID LAST DATA CHAR YET
1111 011426  103774                        BLO     3$              ;BR IF NOT
1112 011430  052762  100400  177776        BIS     #CRCCHK!RXBCC,-2(R2) ;SET EXPECTED BCC
1113 011436  012726  000160                MOV     #160,(SP)+      ;LOAD HI CRC BYTE
1114 011442  012726  000034                MOV     #034,(SP)+      ;LOAD LO CRC BYTE
1115 011446  012602                        MOV     (SP)+,R2        ;RESTORE R2
1116 011450  012601                        MOV     (SP)+,R1        ;RESTORE R1
1117 011452  000207                        RTS     PC              ;RETURN
1118
1119
1120
1121
1122
```

GLOBAL ERROR REPORT SECTION

```
                                .SBTTL  GLOBAL ERROR REPORT SECTION

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

011454  045  124  045  FMT1:   .ASCIZ  /%T%06%N/
011457  117  066  045
011462  116  000
011464  045  116  045  FMT2:   .ASCIZ  /%N%AFAILING REG: /
011467  101  106  101
011472  111  114  111
011475  116  107  040
011500  122  105  107
011503  072  040  000
011506  045  101  105  FMT3:   .ASCIZ  /%AEXPECTED: %03%S5%AACTUAL: %03%N/
011511  130  120  105
011514  103  124  105
011517  104  072  040
011522  045  117  063
011525  045  123  065
011530  045  101  101
011533  103  124  125
011536  101  114  072
011541  040  045  117
011544  063  045  116
011547  000
011550  045  116  045  FMT4:   .ASCIZ  /%N%T%N%T%N/
011553  124  045  116
011556  045  124  045
011561  116  000
011563  045  117  063  FMT5:   .ASCIZ  /%03%S5%03%S5%03%S5%03%N/
011566  045  123  065
011571  045  117  063
011574  045  123  065
011577  045  117  063
011602  045  123  065
011605  045  117  063
011610  045  116  000
011613  045  123  064  FMT6:   .ASCIZ  /%S4%03%S5%03%S5%03%S5%03%N/
011616  045  117  063
011621  045  123  065
011624  045  117  063
011627  045  123  065
011632  045  117  063
011635  045  123  065
011640  045  117  063
011643  045  116  000
011646  045  124  045  FMT7:   .ASCIZ  /%T%02%N/
011651  117  062  045
011654  116  000
011656  045  101  105  FMT8:   .ASCIZ  /%AEXTENDED REG AX%01%A-%T%N/
011661  130  124  105
011664  116  104  105
011667  104  040  122
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        011672  105     107     040
        011675  101     130     045
        011700  117     061     045
        011703  101     055     045
        011706  124     045     116
        011711  000
    17  011712  045     124     045     FMT9:   .ASCIZ  /%T%N/
        011715  116     000
    18  011717  045     101     120     FMT10:  .ASCIZ  /%APC OF SUBR CALL: %06%N/
        011722  103     040     117
        011725  106     040     123
        011730  125     102     122
        011733  040     103     101
        011736  114     114     072
        011741  040     045     117
        011744  066     045     116
        011747  000
    19  011750  045     101     122     FMT11:  .ASCIZ  /%AREG %02%A LOADED WITH: %03%N/
        011753  105     107     040
        011756  045     117     062
        011761  045     101     040
        011764  114     117     101
        011767  104     105     104
        011772  040     127     111
        011775  124     110     072
        012000  040     045     117
        012003  063     045     116
        012006  000
    20  012007  045     116     045     FMT19:  .ASCIZ  /%N%ATEST %D2%A NOT RUN%N/
        012012  101     124     105
        012015  123     124     040
        012020  045     104     062
        012023  045     101     040
        012026  116     117     124
        012031  040     122     125
        012034  116     045     116
        012037  000
    21  012040  045     116     045     FMT24:  .ASCIZ  /%N%APLEASE INSURE M8207 RUN SWITCH (E28 SW7) IS ON%N/
        012043  101     120     114
        012046  105     101     123
        012051  105     040     111
        012054  116     123     125
        012057  122     105     040
        012062  115     070     062
        012065  060     067     040
        012070  122     125     116
        012073  040     123     127
        012076  111     124     103
        012101  110     040     050
        012104  105     062     070
        012107  040     123     127
        012112  067     051     040
        012115  111     123     040
        012120  117     116     045
        012123  116     000
    22
    23
```

```
     24
     25 012125  103  123  122  EM1:   .ASCIZ  /CSR ADDRESS TIME-OUT (SEL0)/
        012130  040  101  104
        012133  104  122  105
        012136  123  123  040
        012141  124  111  115
        012144  105  055  117
        012147  125  124  040
        012152  050  123  105
        012155  114  060  051
        012160  000
     26 012161  122  105  107  EM2:   .ASCIZ  /REG NOT INITIALIZED BY MST CLR/
        012164  040  116  117
        012167  124  040  111
        012172  116  111  124
        012175  111  101  114
        012200  111  132  105
        012203  104  040  102
        012206  131  040  115
        012211  123  124  040
        012214  103  114  122
        012217  000
     27 012220  122  105  107  EM3:   .ASCIZ  /REG MISCOMPARE/
        012223  040  115  111
        012226  123  103  117
        012231  115  120  101
        012234  122  105  000
     28 012237  122  105  107  EM4:   .ASCIZ  /REG NOT INITIALIZED BY UNIBUS RESET (INIT)/
        012242  040  116  117
        012245  124  040  111
        012250  116  111  124
        012253  111  101  114
        012256  111  132  105
        012261  104  040  102
        012264  131  040  125
        012267  116  111  102
        012272  125  123  040
        012275  122  105  123
        012300  105  124  040
        012303  050  111  116
        012306  111  124  051
        012311  000
     29 012312  115  101  111  EM5:   .ASCIZ  /MAINT CLK BIT STUCK AT 0/
        012315  116  124  040
        012320  103  114  113
        012323  040  102  111
        012326  124  040  123
        012331  124  125  103
        012334  113  040  101
        012337  124  040  060
        012342  000
     30 012343  115  101  111  EM6:   .ASCIZ  /MAINT CLK BIT STUCK AT 1/
        012346  116  124  040
        012351  103  114  113
        012354  040  102  111
        012357  124  040  123
        012362  124  125  103
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                012365  113     040     101
                012370  124     040     061
                012373  000
     31         012374  117     122     104     EM7:    .ASCIZ  /ORDY NOT SET/
                012377  131     040     116
                012402  117     124     040
                012405  123     105     124
                012410  000
     32         012411  117     122     104     EM8:    .ASCIZ  /ORDY NOT CLEARED/
                012414  131     040     116
                012417  117     124     040
                012422  103     114     105
                012425  101     122     105
                012430  104     000
     33         012432  117     103     117     EM9:    .ASCIZ  /OCOR NOT SET/
                012435  122     040     116
                012440  117     124     040
                012443  123     105     124
                012446  000
     34         012447  117     103     117     EM10:   .ASCIZ  /OCOR NOT CLEARED/
                012452  122     040     116
                012455  117     124     040
                012460  103     114     105
                012463  101     122     105
                012466  104     000
     35         012470  117     101     103     EM11:   .ASCIZ  /OACT NOT SET/
                012473  124     040     116
                012476  117     124     040
                012501  123     105     124
                012504  000
     36         012505  117     101     103     EM12:   .ASCIZ  /OACT NOT CLEARED/
                012510  124     040     116
                012513  117     124     040
                012516  103     114     105
                012521  101     122     105
                012524  104     000
     37         012526  125     116     122     EM13:   .ASCIZ  /UNRR NOT CLEARED BY SOM/
                012531  122     040     116
                012534  117     124     040
                012537  103     114     105
                012542  101     122     105
                012545  104     040     102
                012550  131     040     123
                012553  117     115     000
     38         012556  125     116     122     EM14:   .ASCIZ  /UNRR NOT SET/
                012561  122     040     116
                012564  117     124     040
                012567  123     105     124
                012572  000
     39         012573  125     116     122     EM15:   .ASCIZ  /UNRR NOT CLEARED BY OC/
                012576  122     040     116
                012601  117     124     040
                012604  103     114     105
                012607  101     122     105
                012612  104     040     102
                012615  131     040     117
                012620  103     000
```

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    40 012622   125   116   122  EM16:   .ASCIZ  /UNRR NOT CLEARED/
       012625   122   040   116
       012630   117   124   040
       012633   103   114   105
       012636   101   122   105
       012641   104   000
    41 012643   111   122   104  EM17:   .ASCIZ  /IRDY NOT SET/
       012646   131   040   116
       012651   117   124   040
       012654   123   105   124
       012657   000
    42 012660   111   122   104  EM18:   .ASCIZ  /IRDY NOT CLEARED/
       012663   131   040   116
       012666   117   124   040
       012671   103   114   105
       012674   101   122   105
       012677   104   000
    43 012701   111   103   111  EM19:   .ASCIZ  /ICIR NOT SET/
       012704   122   040   116
       012707   117   124   040
       012712   123   105   124
       012715   000
    44 012716   111   103   111  EM20:   .ASCIZ  /ICIR NOT CLEARED/
       012721   122   040   116
       012724   117   124   040
       012727   103   114   105
       012732   101   122   105
       012735   104   000
    45 012737   111   101   103  EM21:   .ASCIZ  /IACT NOT SET/
       012742   124   040   116
       012745   117   124   040
       012750   123   105   124
       012753   000
    46 012754   111   101   103  EM22:   .ASCIZ  /IACT NOT CLEARED/
       012757   124   040   116
       012762   117   124   040
       012765   103   114   105
       012770   101   122   105
       012773   104   000
    47 012775   104   123   123  EM23:   .ASCIZ  /DSSI NOT CLEARED/
       013000   111   040   116
       013003   117   124   040
       013006   103   114   105
       013011   101   122   105
       013014   104   000
    48 013016   104   123   123  EM24:   .ASCIZ  /DSSI NOT SET/
       013021   111   040   116
       013024   117   124   040
       013027   123   105   124
       013032   000
    49 013033   104   123   123  EM25:   .ASCIZ  /DSSI NOT CLEARED BY MST CLR/
       013036   111   040   116
       013041   117   124   040
       013044   103   114   105
       013047   101   122   105
       013052   104   040   102
       013055   131   040   115
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        013060  123  124  040
        013063  103  114  122
        013066  000
     50 013067  111  116  103  EM26:   .ASCIZ  /INCORRECT DATA CHAR RCV'D/
        013072  117  122  122
        013075  105  103  124
        013100  040  104  101
        013103  124  101  040
        013106  103  110  101
        013111  122  040  122
        013114  103  126  047
        013117  104  000
     51 013121  111  116  103  EM27:   .ASCIZ  /INCORRECT CRC BYTE RCV'D/
        013124  117  122  122
        013127  105  103  124
        013132  040  103  122
        013135  103  040  102
        013140  131  124  105
        013143  040  122  103
        013146  126  047  104
        013151  000
     52 013152  122  123  117  EM28:   .ASCIZ  /RSOM NOT CLEARED/
        013155  115  040  116
        013160  117  124  040
        013163  103  114  105
        013166  101  122  105
        013171  104  000
     53 013173  122  123  117  EM29:   .ASCIZ  /RSOM NOT SET/
        013176  115  040  116
        013201  117  124  040
        013204  123  105  124
        013207  000
     54 013210  122  105  117  EM30:   .ASCIZ  /REOM NOT CLEARED/
        013213  115  040  116
        013216  117  124  040
        013221  103  114  105
        013224  101  122  105
        013227  104  000
     55 013231  122  105  117  EM31:   .ASCIZ  /REOM NOT SET/
        013234  115  040  116
        013237  117  124  040
        013242  123  105  124
        013245  000
     56 013246  124  130  104  EM32:   .ASCIZ  /TXDATA BIT NOT CLEARED/
        013251  101  124  101
        013254  040  102  111
        013257  124  040  116
        013262  117  124  040
        013265  103  114  105
        013270  101  122  105
        013273  104  000
     57 013275  124  130  104  EM33:   .ASCIZ  /TXDATA BIT NOT SET/
        013300  101  124  101
        013303  040  102  111
        013306  124  040  116
        013311  117  124  040
        013314  123  105  124
```

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                013317  000
     58 013320  122  103  126  EM34:   .ASCIZ  /RCV'D DATA MISCOMPARE/
        013323  047  104  040
        013326  104  101  124
        013331  101  040  115
        013334  111  123  103
        013337  117  115  120
        013342  101  122  105
        013345  000
     59 013346  102  103  103  EM35:   .ASCIZ  /BCC NOT CLEARED/
        013351  040  116  117
        013354  124  040  103
        013357  114  105  101
        013362  122  105  104
        013365  000
     60 013366  102  103  103  EM36:   .ASCIZ  /BCC NOT SET/
        013371  040  116  117
        013374  124  040  123
        013377  105  124  000
     61 013402  105  102  114  EM37:   .ASCIZ  /EBLK NOT CLEARED/
        013405  113  040  116
        013410  117  124  040
        013413  103  114  105
        013416  101  122  105
        013421  104  000
     62 013423  105  102  114  EM38:   .ASCIZ  /EBLK NOT SET/
        013426  113  040  116
        013431  117  124  040
        013434  123  105  124
        013437  000
     63 013440  122  101  102  EM39:   .ASCIZ  /RAB NOT CLEARED/
        013443  040  116  117
        013446  124  040  103
        013451  114  105  101
        013454  122  105  104
        013457  000
     64 013460  122  101  102  EM40:   .ASCIZ  /RAB NOT SET/
        013463  040  116  117
        013466  124  040  123
        013471  105  124  000
     65 013474  117  126  122  EM41:   .ASCIZ  /OVRR NOT CLEARED/
        013477  122  040  116
        013502  117  124  040
        013505  103  114  105
        013510  101  122  105
        013513  104  000
     66 013515  117  126  122  EM42:   .ASCIZ  /OVRR NOT SET/
        013520  122  040  116
        013523  117  124  040
        013526  123  105  124
        013531  000
     67 013532  123  127  040  EM43:   .ASCIZ  /SW PACK #1 INCORRECT/
        013535  120  101  103
        013540  113  040  043
        013543  061  040  111
        013546  116  103  117
        013551  122  122  105
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                013554  103     124     000
    68          013557  123     127     040     EM44:   .ASCIZ  /SW PACK #2 INCORRECT/
                013562  120     101     103
                013565  113     040     043
                013570  062     040     111
                013573  116     103     117
                013576  122     122     105
                013601  103     124     000
    69          013604  123     127     040     EM45:   .ASCIZ  /SW PACK #3 INCORRECT/
                013607  120     101     103
                013612  113     040     043
                013615  063     040     111
                013620  116     103     117
                013623  122     122     105
                013626  103     124     000
    70          013631  122     103     126     EM46:   .ASCIZ  /RCV SILO NOT CLEARED BY IC/
                013634  040     123     111
                013637  114     117     040
                013642  116     117     124
                013645  040     103     114
                013650  105     101     122
                013653  105     104     040
                013656  102     131     040
                013661  111     103     000
    71          013664  101     123     123     EM47:   .ASCIZ  /ASSEMB BIT COUNT INCORRECT/
                013667  105     115     102
                013672  040     102     111
                013675  124     040     103
                013700  117     125     116
                013703  124     040     111
                013706  116     103     117
                013711  122     122     105
                013714  103     124     000
    72          013717  117     104     104     EM48:   .ASCIZ  /ODD VRC PARITY BIT NOT SET/
                013722  040     126     122
                013725  103     040     120
                013730  101     122     111
                013733  124     131     040
                013736  102     111     124
                013741  040     116     117
                013744  124     040     123
                013747  105     124     000
    73          013752  117     104     104     EM49:   .ASCIZ  /ODD VRC PARITY BIT NOT CLEARED/
                013755  040     126     122
                013760  103     040     120
                013763  101     122     111
                013766  124     131     040
                013771  102     111     124
                013774  040     116     117
                013777  124     040     103
                014002  114     105     101
                014005  122     105     104
                014010  000
    74          014011  105     126     105     EM50:   .ASCIZ  /EVEN VRC PARITY BIT NOT SET/
                014014  116     040     126
                014017  122     103     040
                014022  120     101     122
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        014025  111     124     131
        014030  040     102     111
        014033  124     040     116
        014036  117     124     040
        014041  123     105     124
        014044  000
    75  014045  105     126     105     EM51:   .ASCIZ  /EVEN VRC PARITY BIT NOT CLEARED/
        014050  116     040     126
        014053  122     103     040
        014056  120     101     122
        014061  111     124     131
        014064  040     102     111
        014067  124     040     116
        014072  117     124     040
        014075  103     114     105
        014100  101     122     105
        014103  104     000
    76  014105  122     105     101     EM52:   .ASCIZ  /READY NOT SET AFTER AX REG WRITE/
        014110  104     131     040
        014113  116     117     124
        014116  040     123     105
        014121  124     040     101
        014124  106     124     105
        014127  122     040     101
        014132  130     040     122
        014135  105     107     040
        014140  127     122     111
        014143  124     105     000
    77  014146  122     105     101     EM53:   .ASCIZ  /READY NOT SET AFTER AX REG READ/
        014151  104     131     040
        014154  116     117     124
        014157  040     123     105
        014162  124     040     101
        014165  106     124     105
        014170  122     040:    101
        014173  130     040     122
        014176  105     107     040
        014201  122     105     101
        014204  104     000
    78  014206  124     130     040     EM54:   .ASCIZ  /TX UNDERRUN ERROR/
        014211  125     116     104
        014214  105     122     122
        014217  125     116     040
        014222  105     122     122
        014225  117     122     000
    79  014230  122     124     123     EM60:   .ASCIZ  /RTS NOT SET/
        014233  040     116     117
        014236  124     040     123
        014241  105     124     000
    80  014244  122     124     123     EM65:   .ASCIZ  /RTS NOT CLEARED/
        014247  040     116     117
        014252  124     040     103
        014255  114     105     101
        014260  122     105     104
        014263  000
    81
    82
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     83
     84 014264  111  116  102  DH1:   .ASCIZ  &INBUS/OUTBUS REG &
        014267  125  123  057
        014272  117  125  124
        014275  102  125  123
        014300  040  122  105
        014303  107  040  000
     85 014306  114  111  116  DH2:   .ASCIZ  /LINE UNIT INBUS REGS :/
        014311  105  040  125
        014314  116  111  124
        014317  040  111  116
        014322  102  125  123
        014325  040  122  105
        014330  107  123  040
        014333  072  000
     86 014335  122  105  107  DH3:   .ASCIZ  /REG10   REG11   REG12   REG13/
        014340  061  060  040
        014343  040  040  122
        014346  105  107  061
        014351  061  040  040
        014354  040  122  105
        014357  107  061  062
        014362  040  040  040
        014365  122  105  107
        014370  061  063  000
     87 014373  040  040  040  DH4:   .ASCIZ  /    REG14   REG15   REG16   REG17/
        014376  040  122  105
        014401  107  061  064
        014404  040  040  040
        014407  122  105  107
        014412  061  065  040
        014415  040  040  122
        014420  105  107  061
        014423  066  040  040
        014426  040  122  105
        014431  107  061  067
        014434  000
     88 014435  061  065  000  DH5:   .ASCIZ  /15/
     89 014440  061  066  000  DH6:   .ASCIZ  /16/
     90 014443  114  111  116  DH7:   .ASCIZ  /LINE UNIT EXTENDED REGS :/
        014446  105  040  125
        014451  116  111  124
        014454  040  105  130
        014457  124  105  116
        014462  104  105  104
        014465  040  122  105
        014470  107  123  040
        014473  072  000
     91 014475  101  130  060  DH8:   .ASCIZ  /AX0-15  AX0-16  AX1-15  AX1-16/
        014500  055  061  065
        014503  040  040  101
        014506  130  060  055
        014511  061  066  040
        014514  040  101  130
        014517  061  055  061
        014522  065  040  040
        014525  101  130  061
```

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                                                                                                                    H 8
        014530      055      061      066
        014533      000
     92 014534      040      040      040  DH9:    .ASCIZ  /    AX2-15  AX2-16  AX3-15  AX3-16/
        014537      040      101      130
        014542      062      055      061
        014545      065      040      040
        014550      101      130      062
        014553      055      061      066
        014556      040      040      101
        014561      130      063      055
        014564      061      065      040
        014567      040      101      130
        014572      063      055      061
        014575      066      000
     93
     94                                  .EVEN
     95
     96
     97
     98
     99
    100 014600                           BGNMSG  ERR1                                        ERR1::
        014600                           PRINTB  #FMT1,#ADDRES,MPCSR
    101 014600                                                                                       MOV     MPCSR,-(SP)
        014600  013746  002446                                                                       MOV     #ADDRES,-(SP)
        014604  012746  035620                                                                       MOV     #FMT1,-(SP)
        014610  012746  011454                                                                       MOV     #3,-(SP)
        014614  012746  000003                                                                       MOV     SP,R0
        014620  010600                                                                               TRAP    C$PNTB
        014622  104414                                                                               ADD     #10,SP
        014624  062706  000010
    102 014630                           ENDMSG
        014630                                                                                   L10002:
        014630  104423                                                                               TRAP    C$MSG
    103
    104
    105
    106 014632                           BGNMSG  ERR2                                        ERR2::
        014632
    107 014632                           PRINTB  #FMT1,#ADDRES,MPCSR
        014632  013746  002446                                                                       MOV     MPCSR,-(SP)
        014636  012746  035620                                                                       MOV     #ADDRES,-(SP)
        014642  012746  011454                                                                       MOV     #FMT1,-(SP)
        014646  012746  000003                                                                       MOV     #3,-(SP)
        014652  010600                                                                               MOV     SP,R0
        014654  104414                                                                               TRAP    C$PNTB
        014656  062706  000010                                                                       ADD     #10,SP
    108 014662                           PRINTB  #FMT2
        014662  012746  011464                                                                       MOV     #FMT2,-(SP)
        014666  012746  000001                                                                       MOV     #1,-(SP)
        014672  010600                                                                               MOV     SP,R0
        014674  104414                                                                               TRAP    C$PNTB
        014676  062706  000004                                                                       ADD     #4,SP
    109 014702                           PRINTB  #FMT7,#DH1,REGNUM
        014702  013746  002400                                                                       MOV     REGNUM,-(SP)
        014706  012746  014264                                                                       MOV     #DH1,-(SP)
        014712  012746  011646                                                                       MOV     #FMT7,-(SP)
```

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                                                                                                    MOV     #3,-(SP)
                                                                                                    MOV     SP,R0
                                                                                                    TRAP    C$PNTB
                                                                                                    ADD     #10,SP
110                                     PRINTB  #FMT3,GOODAT,BADDAT
                                                                                                    MOV     BADDAT,-(SP)
                                                                                                    MOV     GOODAT,-(SP)
                                                                                                    MOV     #FMT3,-(SP)
                                                                                                    MOV     #3,-(SP)
                                                                                                    MOV     SP,R0
                                                                                                    TRAP    C$PNTB
                                                                                                    ADD     #10,SP
111                                     PRINTX  #FMT4,#DH2,#DH3
                                                                                                    MOV     #DH3,-(SP)
                                                                                                    MOV     #DH2,-(SP)
                                                                                                    MOV     #FMT4,-(SP)
                                                                                                    MOV     #3,-(SP)
                                                                                                    MOV     SP,R0
                                                                                                    TRAP    C$PNTX
                                                                                                    ADD     #10,SP
112                                     PRINTX  #FMT5,LUR10,LUR11,LUR12,LUR13
                                                                                                    MOV     LUR13,-(SP)
                                                                                                    MOV     LUR12,-(SP)
                                                                                                    MOV     LUR11,-(SP)
                                                                                                    MOV     LUR10,-(SP)
                                                                                                    MOV     #FMT5,-(SP)
                                                                                                    MOV     #5,-(SP)
                                                                                                    MOV     SP,R0
                                                                                                    TRAP    C$PNTX
                                                                                                    ADD     #14,SP
113                                     PRINTX  #FMT9,#DH4
                                                                                                    MOV     #DH4,-(SP)
                                                                                                    MOV     #FMT9,-(SP)
                                                                                                    MOV     #2,-(SP)
                                                                                                    MOV     SP,R0
                                                                                                    TRAP    C$PNTX
                                                                                                    ADD     #6,SP
114                                     PRINTX  #FMT6,LUR14,LUR15,LUR16,LUR17
                                                                                                    MOV     LUR17,-(SP)
                                                                                                    MOV     LUR16,-(SP)
                                                                                                    MOV     LUR15,-(SP)
                                                                                                    MOV     LUR14,-(SP)
                                                                                                    MOV     #FMT6,-(SP)
                                                                                                    MOV     #5,-(SP)
                                                                                                    MOV     SP,R0
                                                                                                    TRAP    C$PNTX
                                                                                                    ADD     #14,SP
115                                     ENDMSG
                                                                                        L10003:
                                                                                                    TRAP    C$MSG
116
117
118
119
120
121                                     BGNMSG  ERR3
                                                                                        ERR3::
```

```
    122 015140                          PRINTB  #FMT1,#ADDRES,MPCSR
        015140  013746  002446                                        MOV     MPCSR,-(SP)
        015144  012746  035620                                        MOV     #ADDRES,-(SP)
        015150  012746  011454                                        MOV     #FMT1,-(SP)
        015154  012746  000003                                        MOV     #3,-(SP)
        015160  010600                                                MOV     SP,R0
        015162  104414                                                TRAP    C$PNTB
        015164  062706  000010                                        ADD     #10,SP
    123 015170                          PRINTB  #FMT2
        015170  012746  011464                                        MOV     #FMT2,-(SP)
        015174  012746  000001                                        MOV     #1,-(SP)
        015200  010600                                                MOV     SP,R0
        015202  104414                                                TRAP    C$PNTB
        015204  062706  000004                                        ADD     #4,SP
    124 015210                          PRINTB  #FMT8,TMP1,TMP0
        015210  013746  002530                                        MOV     TMP0,-(SP)
        015214  013746  002532                                        MOV     TMP1,-(SP)
        015220  012746  011656                                        MOV     #FMT8,-(SP)
        015224  012746  000003                                        MOV     #3,-(SP)
        015230  010600                                                MOV     SP,R0
        015232  104414                                                TRAP    C$PNTB
        015234  062706  000010                                        ADD     #10,SP
    125 015240                          PRINTB  #FMT3,GOODAT,BADDAT
        015240  013746  002406                                        MOV     BADDAT,-(SP)
        015244  013746  002404                                        MOV     GOODAT,-(SP)
        015250  012746  011506                                        MOV     #FMT3,-(SP)
        015254  012746  000003                                        MOV     #3,-(SP)
        015260  010600                                                MOV     SP,R0
        015262  104414                                                TRAP    C$PNTB
        015264  062706  000010                                        ADD     #10,SP
    126 015270                          PRINTX  #FMT4,#DH2,#DH3
        015270  012746  014335                                        MOV     #DH3,-(SP)
        015274  012746  014306                                        MOV     #DH2,-(SP)
        015300  012746  011550                                        MOV     #FMT4,-(SP)
        015304  012746  000003                                        MOV     #3,-(SP)
        015310  010600                                                MOV     SP,R0
        015312  104415                                                TRAP    C$PNTX
        015314  062706  000010                                        ADD     #10,SP
    127 015320                          PRINTX  #FMT5,LUR10,LUR11,LUR12,LUR13
        015320  013746  002310                                        MOV     LUR13,-(SP)
        015324  013746  002306                                        MOV     LUR12,-(SP)
        015330  013746  002304                                        MOV     LUR11,-(SP)
        015334  013746  002302                                        MOV     LUR10,-(SP)
        015340  012746  011563                                        MOV     #FMT5,-(SP)
        015344  012746  000005                                        MOV     #5,-(SP)
        015350  010600                                                MOV     SP,R0
        015352  104415                                                TRAP    C$PNTX
        015354  062706  000014                                        ADD     #14,SP
    128 015360                          PRINTX  #FMT9,#DH4
        015360  012746  014373                                        MOV     #DH4,-(SP)
        015364  012746  011712                                        MOV     #FMT9,-(SP)
        015370  012746  000002                                        MOV     #2,-(SP)
        015374  010600                                                MOV     SP,R0
        015376  104415                                                TRAP    C$PNTX
        015400  062706  000006                                        ADD     #6,SP
    129 015404                          PRINTX  #FMT6,LUR14,LUR15,LUR16,LUR17
        015404  013746  002320                                        MOV     LUR17,-(SP)
```

```
        015410  013746  002316                                                  MOV     LUR16,-(SP)
        015414  013746  002314                                                  MOV     LUR15,-(SP)
        015420  013746  002312                                                  MOV     LUR14,-(SP)
        015424  012746  011613                                                  MOV     #FMT6,-(SP)
        015430  012746  000005                                                  MOV     #5,-(SP)
        015434  010600                                                          MOV     SP,R0
        015436  104415                                                          TRAP    C$PNTX
        015440  062706  000014                                                  ADD     #14,SP
    130 015444                          PRINTX  #FMT4,#DH7,#DH8
        015444  012746  014475                                                  MOV     #DH8,-(SP)
        015450  012746  014443                                                  MOV     #DH7,-(SP)
        015454  012746  011550                                                  MOV     #FMT4,-(SP)
        015460  012746  000003                                                  MOV     #3,-(SP)
        015464  010600                                                          MOV     SP,R0
        015466  104415                                                          TRAP    C$PNTX
        015470  062706  000010                                                  ADD     #10,SP
    131 015474                          PRINTX  #FMT5,AX0.15,AX0.16,AX1.15,AX1.16
        015474  013746  002330                                                  MOV     AX1.16,-(SP)
        015500  013746  002326                                                  MOV     AX1.15,-(SP)
        015504  013746  002324                                                  MOV     AX0.16,-(SP)
        015510  013746  002322                                                  MOV     AX0.15,-(SP)
        015514  012746  011563                                                  MOV     #FMT5,-(SP)
        015520  012746  000005                                                  MOV     #5,-(SP)
        015524  010600                                                          MOV     SP,R0
        015526  104415                                                          TRAP    C$PNTX
        015530  062706  000014                                                  ADD     #14,SP
    132 015534                          PRINTX  #FMT9,#DH9
        015534  012746  014534                                                  MOV     #DH9,-(SP)
        015540  012746  011712                                                  MOV     #FMT9,-(SP)
        015544  012746  000002                                                  MOV     #2,-(SP)
        015550  010600                                                          MOV     SP,R0
        015552  104415                                                          TRAP    C$PNTX
        015554  062706  000006                                                  ADD     #6,SP
    133 015560                          PRINTX  #FMT6,AX2.15,AX2.16,AX3.15,AX3.16
        015560  013746  002340                                                  MOV     AX3.16,-(SP)
        015564  013746  002336                                                  MOV     AX3.15,-(SP)
        015570  013746  002334                                                  MOV     AX2.16,-(SP)
        015574  013746  002332                                                  MOV     AX2.15,-(SP)
        015600  012746  011613                                                  MOV     #FMT6,-(SP)
        015604  012746  000005                                                  MOV     #5,-(SP)
        015610  010600                                                          MOV     SP,R0
        015612  104415                                                          TRAP    C$PNTX
        015614  062706  000014                                                  ADD     #14,SP
    134 015620                          ENDMSG
        015620                                                          L10004:
        015620  104423                                                          TRAP    C$MSG
    135
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    140 015622                          BGNMSG  ERR4
        015622                                                          ERR4::
    141 015622                          PRINTB  #FMT10,SUBRPC
        015622  013746  002352                                                  MOV     SUBRPC,-(SP)
        015626  012746  011717                                                  MOV     #FMT10,-(SP)
        015632  012746  000002                                                  MOV     #2,-(SP)
```

```
        015636  010600                                                  MOV     SP,R0
        015640  104414                                                  TRAP    C$PNTB
        015642  062706  000006                                          ADD     #6,SP
    142 015646                          PRINTB  #FMT1,#ADDRES,MPCSR
        015646  013746  002446                                          MOV     MPCSR,-(SP)
        015652  012746  035620                                          MOV     #ADDRES,-(SP)
        015656  012746  011454                                          MOV     #FMT1,-(SP)
        015662  012746  000003                                          MOV     #3,-(SP)
        015666  010600                                                  MOV     SP,R0
        015670  104414                                                  TRAP    C$PNTB
        015672  062706  000010                                          ADD     #10,SP
    143 015676                          PRINTB  #FMT2
        015676  012746  011464                                          MOV     #FMT2,-(SP)
        015702  012746  000001                                          MOV     #1,-(SP)
        015706  010600                                                  MOV     SP,R0
        015710  104414                                                  TRAP    C$PNTB
        015712  062706  000004                                          ADD     #4,SP
    144 015716                          PRINTB  #FMT7,#DH1,REGNUM
        015716  013746  002400                                          MOV     REGNUM,-(SP)
        015722  012746  014264                                          MOV     #DH1,-(SP)
        015726  012746  011646                                          MOV     #FMT7,-(SP)
        015732  012746  000003                                          MOV     #3,-(SP)
        015736  010600                                                  MOV     SP,R0
        015740  104414                                                  TRAP    C$PNTB
        015742  062706  000010                                          ADD     #10,SP
    145 015746                          PRINTX  #FMT4,#DH2,#DH3
        015746  012746  014335                                          MOV     #DH3,-(SP)
        015752  012746  014306                                          MOV     #DH2,-(SP)
        015756  012746  011550                                          MOV     #FMT4,-(SP)
        015762  012746  000003                                          MOV     #3,-(SP)
        015766  010600                                                  MOV     SP,R0
        015770  104415                                                  TRAP    C$PNTX
        015772  062706  000010                                          ADD     #10,SP
    146 015776                          PRINTX  #FMT5,LUR10,LUR11,LUR12,LUR13
        015776  013746  002310                                          MOV     LUR13,-(SP)
        016002  013746  002306                                          MOV     LUR12,-(SP)
        016006  013746  002304                                          MOV     LUR11,-(SP)
        016012  013746  002302                                          MOV     LUR10,-(SP)
        016016  012746  011563                                          MOV     #FMT5,-(SP)
        016022  012746  000005                                          MOV     #5,-(SP)
        016026  010600                                                  MOV     SP,R0
        016030  104415                                                  TRAP    C$PNTX
        016032  062706  000014                                          ADD     #14,SP
    147 016036                          PRINTX  #FMT9,#DH4
        016036  012746  014373                                          MOV     #DH4,-(SP)
        016042  012746  011712                                          MOV     #FMT9,-(SP)
        016046  012746  000002                                          MOV     #2,-(SP)
        016052  010600                                                  MOV     SP,R0
        016054  104415                                                  TRAP    C$PNTX
        016056  062706  000006                                          ADD     #6,SP
    148 016062                          PRINTX  #FMT6,LUR14,LUR15,LUR16,LUR17
        016062  013746  002320                                          MOV     LUR17,-(SP)
        016066  013746  002316                                          MOV     LUR16,-(SP)
        016072  013746  002314                                          MOV     LUR15,-(SP)
        016076  013746  002312                                          MOV     LUR14,-(SP)
        016102  012746  011613                                          MOV     #FMT6,-(SP)
        016106  012746  000005                                          MOV     #5,-(SP)
```

```
                016112  010600                                                          MOV     SP,R0
                016114  104415                                                          TRAP    C$PNTX
                016116  062706  000014                                                  ADD     #14,SP
    149         016122                  PRINTX  #FMT4,#DH7,#DH8
                016122  012746  014475                                                  MOV     #DH8,-(SP)
                016126  012746  014443                                                  MOV     #DH7,-(SP)
                016132  012746  011550                                                  MOV     #FMT4,-(SP)
                016136  012746  000003                                                  MOV     #3,-(SP)
                016142  010600                                                          MOV     SP,R0
                016144  104415                                                          TRAP    C$PNTX
                016146  062706  000010                                                  ADD     #10,SP
    150         016152                  PRINTX  #FMT5,AX0.15,AX0.16,AX1.15,AX1.16
                016152  013746  002330                                                  MOV     AX1.16,-(SP)
                016156  013746  002326                                                  MOV     AX1.15,-(SP)
                016162  013746  002324                                                  MOV     AX0.16,-(SP)
                016166  013746  002322                                                  MOV     AX0.15,-(SP)
                016172  012746  011563                                                  MOV     #FMT5,-(SP)
                016176  012746  000005                                                  MOV     #5,-(SP)
                016202  010600                                                          MOV     SP,R0
                016204  104415                                                          TRAP    C$PNTX
                016206  062706  000014                                                  ADD     #14,SP
    151         016212                  PRINTX  #FMT9,#DH9
                016212  012746  014534                                                  MOV     #DH9,-(SP)
                016216  012746  011712                                                  MOV     #FMT9,-(SP)
                016222  012746  000002                                                  MOV     #2,-(SP)
                016226  010600                                                          MOV     SP,R0
                016230  104415                                                          TRAP    C$PNTX
                016232  062706  000006                                                  ADD     #6,SP
    152         016236                  PRINTX  #FMT6,AX2.15,AX2.16,AX3.15,AX3.16
                016236  013746  002340                                                  MOV     AX3.16,-(SP)
                016242  013746  002336                                                  MOV     AX3.15,-(SP)
                016246  013746  002334                                                  MOV     AX2.16,-(SP)
                016252  013746  002332                                                  MOV     AX2.15,-(SP)
                016256  012746  011613                                                  MOV     #FMT6,-(SP)
                016262  012746  000005                                                  MOV     #5,-(SP)
                016266  010600                                                          MOV     SP,R0
                016270  104415                                                          TRAP    C$PNTX
                016272  062706  000014                                                  ADD     #14,SP
    153         016276                  ENDMSG
                016276                                                          L10005:
                016276  104423                                                          TRAP    C$MSG
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    159         016300                  BGNMSG  ERR5
                016300                                                          ERR5::
    160         016300                  PRINTB  #FMT1,#ADDRES,MPCSR
                016300  013746  002446                                                  MOV     MPCSR,-(SP)
                016304  012746  035620                                                  MOV     #ADDRES,-(SP)
                016310  012746  011454                                                  MOV     #FMT1,-(SP)
                016314  012746  000003                                                  MOV     #3,-(SP)
                016320  010600                                                          MOV     SP,R0
                016322  104414                                                          TRAP    C$PNTB
                016324  062706  000010                                                  ADD     #10,SP
    161         016330                  PRINTB  #FMT11,REGNUM,LOADAT
```

```
        016330  013746  002410                                          MOV     LOADAT,-(SP)
        016334  013746  002400                                          MOV     REGNUM,-(SP)
        016340  012746  011750                                          MOV     #FMT11,-(SP)
        016344  012746  000003                                          MOV     #3,-(SP)
        016350  010600                                                  MOV     SP,R0
        016352  104414                                                  TRAP    C$PNTB
        016354  062706  000010                                          ADD     #10,SP
    162 016360                          PRINTB  #FMT2
        016360  012746  011464                                          MOV     #FMT2,-(SP)
        016364  012746  000001                                          MOV     #1,-(SP)
        016370  010600                                                  MOV     SP,R0
        016372  104414                                                  TRAP    C$PNTB
        016374  062706  000004                                          ADD     #4,SP
    163 016400                          PRINTB  #FMT8,TMP1,TMP0
        016400  013746  002530                                          MOV     TMP0,-(SP)
        016404  013746  002532                                          MOV     TMP1,-(SP)
        016410  012746  011656                                          MOV     #FMT8,-(SP)
        016414  012746  000003                                          MOV     #3,-(SP)
        016420  010600                                                  MOV     SP,R0
        016422  104414                                                  TRAP    C$PNTB
        016424  062706  000010                                          ADD     #10,SP
    164 016430                          PRINTB  #FMT3,GOODAT,BADDAT
        016430  013746  002406                                          MOV     BADDAT,-(SP)
        016434  013746  002404                                          MOV     GOODAT,-(SP)
        016440  012746  011506                                          MOV     #FMT3,-(SP)
        016444  012746  000003                                          MOV     #3,-(SP)
        016450  010600                                                  MOV     SP,R0
        016452  104414                                                  TRAP    C$PNTB
        016454  062706  000010                                          ADD     #10,SP
    165 016460                          PRINTX  #FMT4,#DH2,#DH3
        016460  012746  014335                                          MOV     #DH3,-(SP)
        016464  012746  014306                                          MOV     #DH2,-(SP)
        016470  012746  011550                                          MOV     #FMT4,-(SP)
        016474  012746  000003                                          MOV     #3,-(SP)
        016500  010600                                                  MOV     SP,R0
        016502  104415                                                  TRAP    C$PNTX
        016504  062706  000010                                          ADD     #10,SP
    166 016510                          PRINTX  #FMT5,LUR10,LUR11,LUR12,LUR13
        016510  013746  002310                                          MOV     LUR13,-(SP)
        016514  013746  002306                                          MOV     LUR12,-(SP)
        016520  013746  002304                                          MOV     LUR11,-(SP)
        016524  013746  002302                                          MOV     LUR10,-(SP)
        016530  012746  011563                                          MOV     #FMT5,-(SP)
        016534  012746  000005                                          MOV     #5,-(SP)
        016540  010600                                                  MOV     SP,R0
        016542  104415                                                  TRAP    C$PNTX
        016544  062706  000014                                          ADD     #14,SP
    167 016550                          PRINTX  #FMT9,#DH4
        016550  012746  014373                                          MOV     #DH4,-(SP)
        016554  012746  011712                                          MOV     #FMT9,-(SP)
        016560  012746  000002                                          MOV     #2,-(SP)
        016564  010600                                                  MOV     SP,R0
        016566  104415                                                  TRAP    C$PNTX
        016570  062706  000006                                          ADD     #6,SP
    168 016574                          PRINTX  #FMT6,LUR14,LUR15,LUR16,LUR17
        016574  013746  002320                                          MOV     LUR17,-(SP)
        016600  013746  002316                                          MOV     LUR16,-(SP)
```

```
        016604  013746  002314                                                  MOV     LUR15,-(SP)
        016610  013746  002312                                                  MOV     LUR14,-(SP)
        016614  012746  011613                                                  MOV     #FMT6,-(SP)
        016620  012746  000005                                                  MOV     #5,-(SP)
        016624  010600                                                          MOV     SP,R0
        016626  104415                                                          TRAP    C$PNTX
        016630  062706  000014                                                  ADD     #14,SP
    169 016634                          PRINTX  #FMT4,#DH7,#DH8
        016634  012746  014475                                                  MOV     #DH8,-(SP)
        016640  012746  014443                                                  MOV     #DH7,-(SP)
        016644  012746  011550                                                  MOV     #FMT4,-(SP)
        016650  012746  000003                                                  MOV     #3,-(SP)
        016654  010600                                                          MOV     SP,R0
        016656  104415                                                          TRAP    C$PNTX
        016660  062706  000010                                                  ADD     #10,SP
    170 016664                          PRINTX  #FMT5,AX0.15,AX0.16,AX1.15,AX1.16
        016664  013746  002330                                                  MOV     AX1.16,-(SP)
        016670  013746  002326                                                  MOV     AX1.15,-(SP)
        016674  013746  002324                                                  MOV     AX0.16,-(SP)
        016700  013746  002322                                                  MOV     AX0.15,-(SP)
        016704  012746  011563                                                  MOV     #FMT5,-(SP)
        016710  012746  000005                                                  MOV     #5,-(SP)
        016714  010600                                                          MOV     SP,R0
        016716  104415                                                          TRAP    C$PNTX
        016720  062706  000014                                                  ADD     #14,SP
    171 016724                          PRINTX  #FMT9,#DH9
        016724  012746  014534                                                  MOV     #DH9,-(SP)
        016730  012746  011712                                                  MOV     #FMT9,-(SP)
        016734  012746  000002                                                  MOV     #2,-(SP)
        016740  010600                                                          MOV     SP,R0
        016742  104415                                                          TRAP    C$PNTX
        016744  062706  000006                                                  ADD     #6,SP
    172 016750                          PRINTX  #FMT6,AX2.15,AX2.16,AX3.15,AX3.16
        016750  013746  002340                                                  MOV     AX3.16,-(SP)
        016754  013746  002336                                                  MOV     AX3.15,-(SP)
        016760  013746  002334                                                  MOV     AX2.16,-(SP)
        016764  013746  002332                                                  MOV     AX2.15,-(SP)
        016770  012746  011613                                                  MOV     #FMT6,-(SP)
        016774  012746  000005                                                  MOV     #5,-(SP)
        017000  010600                                                          MOV     SP,R0
        017002  104415                                                          TRAP    C$PNTX
        017004  062706  000014                                                  ADD     #14,SP
    173 017010                          ENDMSG
        017010                                                          L10006:
        017010  104423                                                          TRAP    C$MSG
    174
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    179 017012                          BGNMSG  ERR6
        017012                                                          ERR6::
    180 017012                          PRINTB  #FMT10,SUBRPC
        017012  013746  002352                                                  MOV     SUBRPC,-(SP)
        017016  012746  011717                                                  MOV     #FMT10,-(SP)
        017022  012746  000002                                                  MOV     #2,-(SP)
        017026  010600                                                          MOV     SP,R0
```

```
        017030  104414                                                          TRAP    C$PNTB
        017032  062706  000006                                                  ADD     #6,SP
    181 017036                          PRINTB  #FMT1,#ADDRES,MPCSR
        017036  013746  002446                                                  MOV     MPCSR,-(SP)
        017042  012746  035620                                                  MOV     #ADDRES,-(SP)
        017046  012746  011454                                                  MOV     #FMT1,-(SP)
        017052  012746  000003                                                  MOV     #3,-(SP)
        017056  010600                                                          MOV     SP,R0
        017060  104414                                                          TRAP    C$PNTB
        017062  062706  000010                                                  ADD     #10,SP
    182 017066                          PRINTB  #FMT2
        017066  012746  011464                                                  MOV     #FMT2,-(SP)
        017072  012746  000001                                                  MOV     #1,-(SP)
        017076  010600                                                          MOV     SP,R0
        017100  104414                                                          TRAP    C$PNTB
        017102  062706  000004                                                  ADD     #4,SP
    183 017106                          PRINTB  #FMT8,TMP1,TMP0
        017106  013746  002530                                                  MOV     TMP0,-(SP)
        017112  013746  002532                                                  MOV     TMP1,-(SP)
        017116  012746  011656                                                  MOV     #FMT8,-(SP)
        017122  012746  000003                                                  MOV     #3,-(SP)
        017126  010600                                                          MOV     SP,R0
        017130  104414                                                          TRAP    C$PNTB
        017132  062706  000010                                                  ADD     #10,SP
    184 017136                          PRINTX  #FMT4,#DH2,#DH3
        017136  012746  014335                                                  MOV     #DH3,-(SP)
        017142  012746  014306                                                  MOV     #DH2,-(SP)
        017146  012746  011550                                                  MOV     #FMT4,-(SP)
        017152  012746  000003                                                  MOV     #3,-(SP)
        017156  010600                                                          MOV     SP,R0
        017160  104415                                                          TRAP    C$PNTX
        017162  062706  000010                                                  ADD     #10,SP
    185 017166                          PRINTX  #FMT5,LUR10,LUR11,LUR12,LUR13
        017166  013746  002310                                                  MOV     LUR13,-(SP)
        017172  013746  002306                                                  MOV     LUR12,-(SP)
        017176  013746  002304                                                  MOV     LUR11,-(SP)
        017202  013746  002302                                                  MOV     LUR10,-(SP)
        017206  012746  011563                                                  MOV     #FMT5,-(SP)
        017212  012746  000005                                                  MOV     #5,-(SP)
        017216  010600                                                          MOV     SP,R0
        017220  104415                                                          TRAP    C$PNTX
        017222  062706  000014                                                  ADD     #14,SP
    186 017226                          PRINTX  #FMT9,#DH4
        017226  012746  014373                                                  MOV     #DH4,-(SP)
        017232  012746  011712                                                  MOV     #FMT9,-(SP)
        017236  012746  000002                                                  MOV     #2,-(SP)
        017242  010600                                                          MOV     SP,R0
        017244  104415                                                          TRAP    C$PNTX
        017246  062706  000006                                                  ADD     #6,SP
    187 017252                          PRINTX  #FMT6,LUR14,LUR15,LUR16,LUR17
        017252  013746  002320                                                  MOV     LUR17,-(SP)
        017256  013746  002316                                                  MOV     LUR16,-(SP)
        017262  013746  002314                                                  MOV     LUR15,-(SP)
        017266  013746  002312                                                  MOV     LUR14,-(SP)
        017272  012746  011613                                                  MOV     #FMT6,-(SP)
        017276  012746  000005                                                  MOV     #5,-(SP)
        017302  010600                                                          MOV     SP,R0
```

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                                                                                                                    D 9
        017304  104415                                                                                      TRAP    C$PNTX
        017306  062706  000014                                                                              ADD     #14,SP
    188 017312                          PRINTX  #FMT4,#DH7,#DH8
        017312  012746  014475                                                                              MOV     #DH8,-(SP)
        017316  012746  014443                                                                              MOV     #DH7,-(SP)
        017322  012746  011550                                                                              MOV     #FMT4,-(SP)
        017326  012746  000003                                                                              MOV     #3,-(SP)
        017332  010600                                                                                      MOV     SP,R0
        017334  104415                                                                                      TRAP    C$PNTX
        017336  062706  000010                                                                              ADD     #10,SP
    189 017342                          PRINTX  #FMT5,AX0.15,AX0.16,AX1.15,AX1.16
        017342  013746  002330                                                                              MOV     AX1.16,-(SP)
        017346  013746  002326                                                                              MOV     AX1.15,-(SP)
        017352  013746  002324                                                                              MOV     AX0.16,-(SP)
        017356  013746  002322                                                                              MOV     AX0.15,-(SP)
        017362  012746  011563                                                                              MOV     #FMT5,-(SP)
        017366  012746  000005                                                                              MOV     #5,-(SP)
        017372  010600                                                                                      MOV     SP,R0
        017374  104415                                                                                      TRAP    C$PNTX
        017376  062706  000014                                                                              ADD     #14,SP
    190 017402                          PRINTX  #FMT9,#DH9
        017402  012746  014534                                                                              MOV     #DH9,-(SP)
        017406  012746  011712                                                                              MOV     #FMT9,-(SP)
        017412  012746  000002                                                                              MOV     #2,-(SP)
        017416  010600                                                                                      MOV     SP,R0
        017420  104415                                                                                      TRAP    C$PNTX
        017422  062706  000006                                                                              ADD     #6,SP
    191 017426                          PRINTX  #FMT6,AX2.15,AX2.16,AX3.15,AX3.16
        017426  013746  002340                                                                              MOV     AX3.16,-(SP)
        017432  013746  002336                                                                              MOV     AX3.15,-(SP)
        017436  013746  002334                                                                              MOV     AX2.16,-(SP)
        017442  013746  002332                                                                              MOV     AX2.15,-(SP)
        017446  012746  011613                                                                              MOV     #FMT6,-(SP)
        017452  012746  000005                                                                              MOV     #5,-(SP)
        017456  010600                                                                                      MOV     SP,R0
        017460  104415                                                                                      TRAP    C$PNTX
        017462  062706  000014                                                                              ADD     #14,SP
    192 017466                          ENDMSG
        017466                                                                                      L10007:
        017466  104423                                                                                      TRAP    C$MSG
    193
    194
    195
    196
    197
    198 017470                          BGNMSG  ERR7
        017470                                                                                      ERR7::
    199 017470                          PRINTB  #FMT1,#ADDRES,MPCSR
        017470  013746  002446                                                                              MOV     MPCSR,-(SP)
        017474  012746  035620                                                                              MOV     #ADDRES,-(SP)
        017500  012746  011454                                                                              MOV     #FMT1,-(SP)
        017504  012746  000003                                                                              MOV     #3,-(SP)
        017510  010600                                                                                      MOV     SP,R0
        017512  104414                                                                                      TRAP    C$PNTB
        017514  062706  000010                                                                              ADD     #10,SP
    200 017520                          PRINTB  #FMT2
        017520  012746  011464                                                                              MOV     #FMT2,-(SP)
```

```
        017524  012746  000001                                          MOV     #1,-(SP)
        017530  010600                                                  MOV     SP,R0
        017532  104414                                                  TRAP    C$PNTB
        017534  062706  000004                                          ADD     #4,SP
    201 017540                          PRINTB  #FMT7,#DH1,REGNUM
        017540  013746  002400                                          MOV     REGNUM,-(SP)
        017544  012746  014264                                          MOV     #DH1,-(SP)
        017550  012746  011646                                          MOV     #FMT7,-(SP)
        017554  012746  000003                                          MOV     #3,-(SP)
        017560  010600                                                  MOV     SP,R0
        017562  104414                                                  TRAP    C$PNTB
        017564  062706  000010                                          ADD     #10,SP
    202 017570                          PRINTX  #FMT4,#DH2,#DH3
        017570  012746  014335                                          MOV     #DH3,-(SP)
        017574  012746  014306                                          MOV     #DH2,-(SP)
        017600  012746  011550                                          MOV     #FMT4,-(SP)
        017604  012746  000003                                          MOV     #3,-(SP)
        017610  010600                                                  MOV     SP,R0
        017612  104415                                                  TRAP    C$PNTX
        017614  062706  000010                                          ADD     #10,SP
    203 017620                          PRINTX  #FMT5,LUR10,LUR11,LUR12,LUR13
        017620  013746  002310                                          MOV     LUR13,-(SP)
        017624  013746  002306                                          MOV     LUR12,-(SP)
        017630  013746  002304                                          MOV     LUR11,-(SP)
        017634  013746  002302                                          MOV     LUR10,-(SP)
        017640  012746  011563                                          MOV     #FMT5,-(SP)
        017644  012746  000005                                          MOV     #5,-(SP)
        017650  010600                                                  MOV     SP,R0
        017652  104415                                                  TRAP    C$PNTX
        017654  062706  000014                                          ADD     #14,SP
    204 017660                          PRINTX  #FMT9,#DH4
        017660  012746  014373                                          MOV     #DH4,-(SP)
        017664  012746  011712                                          MOV     #FMT9,-(SP)
        017670  012746  000002                                          MOV     #2,-(SP)
        017674  010600                                                  MOV     SP,R0
        017676  104415                                                  TRAP    C$PNTX
        017700  062706  000006                                          ADD     #6,SP
    205 017704                          PRINTX  #FMT6,LUR14,LUR15,LUR16,LUR17
        017704  013746  002320                                          MOV     LUR17,-(SP)
        017710  013746  002316                                          MOV     LUR16,-(SP)
        017714  013746  002314                                          MOV     LUR15,-(SP)
        017720  013746  002312                                          MOV     LUR14,-(SP)
        017724  012746  011613                                          MOV     #FMT6,-(SP)
        017730  012746  000005                                          MOV     #5,-(SP)
        017734  010600                                                  MOV     SP,R0
        017736  104415                                                  TRAP    C$PNTX
        017740  062706  000014                                          ADD     #14,SP
    206 017744                          PRINTX  #FMT4,#DH7,#DH8
        017744  012746  014475                                          MOV     #DH8,-(SP)
        017750  012746  014443                                          MOV     #DH7,-(SP)
        017754  012746  011550                                          MOV     #FMT4,-(SP)
        017760  012746  000003                                          MOV     #3,-(SP)
        017764  010600                                                  MOV     SP,R0
        017766  104415                                                  TRAP    C$PNTX
        017770  062706  000010                                          ADD     #10,SP
    207 017774                          PRINTX  #FMT5,AX0.15,AX0.16,AX1.15,AX1.16
        017774  013746  002330                                          MOV     AX1.16,-(SP)
```

```
        020000  013746  002326                                                  MOV     AX1.15,-(SP)
        020004  013746  002324                                                  MOV     AX0.16,-(SP)
        020010  013746  002322                                                  MOV     AX0.15,-(SP)
        020014  012746  011563                                                  MOV     #FMT5,-(SP)
        020020  012746  000005                                                  MOV     #5,-(SP)
        020024  010600                                                          MOV     SP,R0
        020026  104415                                                          TRAP    C$PNTX
        020030  062706  000014                                                  ADD     #14,SP
    208 020034                          PRINTX  #FMT9,#DH9
        020034  012746  014534                                                  MOV     #DH9,-(SP)
        020040  012746  011712                                                  MOV     #FMT9,-(SP)
        020044  012746  000002                                                  MOV     #2,-(SP)
        020050  010600                                                          MOV     SP,R0
        020052  104415                                                          TRAP    C$PNTX
        020054  062706  000006                                                  ADD     #6,SP
    209 020060                          PRINTX  #FMT6,AX2.15,AX2.16,AX3.15,AX3.16
        020060  013746  002340                                                  MOV     AX3.16,-(SP)
        020064  013746  002336                                                  MOV     AX3.15,-(SP)
        020070  013746  002334                                                  MOV     AX2.16,-(SP)
        020074  013746  002332                                                  MOV     AX2.15,-(SP)
        020100  012746  011613                                                  MOV     #FMT6,-(SP)
        020104  012746  000005                                                  MOV     #5,-(SP)
        020110  010600                                                          MOV     SP,R0
        020112  104415                                                          TRAP    C$PNTX
        020114  062706  000014                                                  ADD     #14,SP
    210 020120                          ENDMSG
        020120                                                          L10010:
        020120  104423                                                          TRAP    C$MSG
    211
    212
    213
    214
    215
    216 020122                          BGNMSG  ERR8
        020122                                                          ERR8::
    217 020122                          PRINTB  #FMT10,SUBRPC
        020122  013746  002352                                                  MOV     SUBRPC,-(SP)
        020126  012746  011717                                                  MOV     #FMT10,-(SP)
        020132  012746  000002                                                  MOV     #2,-(SP)
        020136  010600                                                          MOV     SP,R0
        020140  104414                                                          TRAP    C$PNTB
        020142  062706  000006                                                  ADD     #6,SP
    218 020146                          PRINTB  #FMT1,#ADDRES,MPCSR
        020146  013746  002446                                                  MOV     MPCSR,-(SP)
        020152  012746  035620                                                  MOV     #ADDRES,-(SP)
        020156  012746  011454                                                  MOV     #FMT1,-(SP)
        020162  012746  000003                                                  MOV     #3,-(SP)
        020166  010600                                                          MOV     SP,R0
        020170  104414                                                          TRAP    C$PNTB
        020172  062706  000010                                                  ADD     #10,SP
    219 020176                          PRINTB  #FMT2
        020176  012746  011464                                                  MOV     #FMT2,-(SP)
        020202  012746  000001                                                  MOV     #1,-(SP)
        020206  010600                                                          MOV     SP,R0
        020210  104414                                                          TRAP    C$PNTB
        020212  062706  000004                                                  ADD     #4,SP
    220 020216                          PRINTB  #FMT7,#DH1,REGNUM
```

```
        020216  013746  002400                                          MOV     REGNUM,-(SP)
        020222  012746  014264                                          MOV     #DH1,-(SP)
        020226  012746  011646                                          MOV     #FMT7,-(SP)
        020232  012746  000003                                          MOV     #3,-(SP)
        020236  010600                                                  MOV     SP,R0
        020240  104414                                                  TRAP    C$PNTB
        020242  062706  000010                                          ADD     #10,SP
    221 020246                          PRINTB  #FMT3,GOODAT,BADDAT
        020246  013746  002406                                          MOV     BADDAT,-(SP)
        020252  013746  002404                                          MOV     GOODAT,-(SP)
        020256  012746  011506                                          MOV     #FMT3,-(SP)
        020262  012746  000003                                          MOV     #3,-(SP)
        020266  010600                                                  MOV     SP,R0
        020270  104414                                                  TRAP    C$PNTB
        020272  062706  000010                                          ADD     #10,SP
    222 020276                          PRINTX  #FMT4,#DH2,#DH3
        020276  012746  014335                                          MOV     #DH3,-(SP)
        020302  012746  014306                                          MOV     #DH2,-(SP)
        020306  012746  011550                                          MOV     #FMT4,-(SP)
        020312  012746  000003                                          MOV     #3,-(SP)
        020316  010600                                                  MOV     SP,R0
        020320  104415                                                  TRAP    C$PNTX
        020322  062706  000010                                          ADD     #10,SP
    223 020326                          PRINTX  #FMT5,LUR10,LJR11,LUR12,LUR13
        020326  013746  002310                                          MOV     LUR13,-(SP)
        020332  013746  002306                                          MOV     LUR12,-(SP)
        020336  013746  002304                                          MOV     LUR11,-(SP)
        020342  013746  002302                                          MOV     LUR10,-(SP)
        020346  012746  011563                                          MOV     #FMT5,-(SP)
        020352  012746  000005                                          MOV     #5,-(SP)
        020356  010600                                                  MOV     SP,R0
        020360  104415                                                  TRAP    C$PNTX
        020362  062706  000014                                          ADD     #14,SP
    224 020366                          PRINTX  #FMT9,#DH4
        020366  012746  014373                                          MOV     #DH4,-(SP)
        020372  012746  011712                                          MOV     #FMT9,-(SP)
        020376  012746  000002                                          MOV     #2,-(SP)
        020402  010600                                                  MOV     SP,R0
        020404  104415                                                  TRAP    C$PNTX
        020406  062706  000006                                          ADD     #6,SP
    225 020412                          PRINTX  #FMT6,LUR14,LUR15,LUR16,LUR17
        020412  013746  002320                                          MOV     LUR17,-(SP)
        020416  013746  002316                                          MOV     LUR16,-(SP)
        020422  013746  002314                                          MOV     LUR15,-(SP)
        020426  013746  002312                                          MOV     LUR14,-(SP)
        020432  012746  011613                                          MOV     #FMT6,-(SP)
        020436  012746  000005                                          MOV     #5,-(SP)
        020442  010600                                                  MOV     SP,R0
        020444  104415                                                  TRAP    C$PNTX
        020446  062706  000014                                          ADD     #14,SP
    226 020452                          PRINTX  #FMT4,#DH7,#DH8
        020452  012746  014475                                          MOV     #DH8,-(SP)
        020456  012746  014443                                          MOV     #DH7,-(SP)
        020462  012746  011550                                          MOV     #FMT4,-(SP)
        020466  012746  000003                                          MOV     #3,-(SP)
        020472  010600                                                  MOV     SP,R0
        020474  104415                                                  TRAP    C$PNTX
```

```
                020476  062706  000010                                                  ADD     #10,SP
227             020502                          PRINTX  #FMT5,AX0.15,AX0.16,AX1.15,AX1.16
                020502  013746  002330                                                  MOV     AX1.16,-(SP)
                020506  013746  002326                                                  MOV     AX1.15,-(SP)
                020512  013746  002324                                                  MOV     AX0.16,-(SP)
                020516  013746  002322                                                  MOV     AX0.15,-(SP)
                020522  012746  011563                                                  MOV     #FMT5,-(SP)
                020526  012746  000005                                                  MOV     #5,-(SP)
                020532  010600                                                          MOV     SP,R0
                020534  104415                                                          TRAP    C$PNTX
                020536  062706  000014                                                  ADD     #14,SP
228             020542                          PRINTX  #FMT9,#DH9
                020542  012746  014534                                                  MOV     #DH9,-(SP)
                020546  012746  011712                                                  MOV     #FMT9,-(SP)
                020552  012746  000002                                                  MOV     #2,-(SP)
                020556  010600                                                          MOV     SP,R0
                020560  104415                                                          TRAP    C$PNTX
                020562  062706  000006                                                  ADD     #6,SP
229             020566                          PRINTX  #FMT6,AX2.15,AX2.16,AX3.15,AX3.16
                020566  013746  002340                                                  MOV     AX3.16,-(SP)
                020572  013746  002336                                                  MOV     AX3.15,-(SP)
                020576  013746  002334                                                  MOV     AX2.16,-(SP)
                020602  013746  002332                                                  MOV     AX2.15,-(SP)
                020606  012746  011613                                                  MOV     #FMT6,-(SP)
                020612  012746  000005                                                  MOV     #5,-(SP)
                020616  010600                                                          MOV     SP,R0
                020620  104415                                                          TRAP    C$PNTX
                020622  062706  000014                                                  ADD     #14,SP
230             020626                          ENDMSG
                020626                                                          L10011:
                020626  104423                                                          TRAP    C$MSG
231
232
233
234
235
236             020630                          BGNMSG  ERR9
                020630                                                          ERR9::
237             020630                          PRINTB  #FMT1,#ADDRES,MPCSR
                020630  013746  002446                                                  MOV     MPCSR,-(SP)
                020634  012746  035620                                                  MOV     #ADDRES,-(SP)
                020640  012746  011454                                                  MOV     #FMT1,-(SP)
                020644  012746  000003                                                  MOV     #3,-(SP)
                020650  010600                                                          MOV     SP,R0
                020652  104414                                                          TRAP    C$PNTB
                020654  062706  000010                                                  ADD     #10,SP
238             020660                          PRINTB  #FMT2
                020660  012746  011464                                                  MOV     #FMT2,-(SP)
                020664  012746  000001                                                  MOV     #1,-(SP)
                020670  010600                                                          MOV     SP,R0
                020672  104414                                                          TRAP    C$PNTB
                020674  062706  000004                                                  ADD     #4,SP
239             020700                          PRINTB  #FMT7,#DH1,REGNUM
                020700  013746  002400                                                  MOV     REGNUM,-(SP)
                020704  012746  014264                                                  MOV     #DH1,-(SP)
                020710  012746  011646                                                  MOV     #FMT7,-(SP)
                020714  012746  000003                                                  MOV     #3,-(SP)
```

```
                020720  010600                                                          MOV     SP,R0
                020722  104414                                                          TRAP    C$PNTB
                020724  062706  000010                                                  ADD     #10,SP
    240         020730                          PRINTX  #FMT4,#DH2,#DH3
                020730  012746  014335                                                  MOV     #DH3,-(SP)
                020734  012746  014306                                                  MOV     #DH2,-(SP)
                020740  012746  011550                                                  MOV     #FMT4,-(SP)
                020744  012746  000003                                                  MOV     #3,-(SP)
                020750  010600                                                          MOV     SP,R0
                020752  104415                                                          TRAP    C$PNTX
                020754  062706  000010                                                  ADD     #10,SP
    241         020760                          PRINTX  #FMT5,LUR10,LUR11,LUR12,LUR13
                020760  013746  002310                                                  MOV     LUR13,-(SP)
                020764  013746  002306                                                  MOV     LUR12,-(SP)
                020770  013746  002304                                                  MOV     LUR11,-(SP)
                020774  013746  002302                                                  MOV     LUR10,-(SP)
                021000  012746  011563                                                  MOV     #FMT5,-(SP)
                021004  012746  000005                                                  MOV     #5,-(SP)
                021010  010600                                                          MOV     SP,R0
                021012  104415                                                          TRAP    C$PNTX
                021014  062706  000014                                                  ADD     #14,SP
    242         021020                          PRINTX  #FMT9,#DH4
                021020  012746  014373                                                  MOV     #DH4,-(SP)
                021024  012746  011712                                                  MOV     #FMT9,-(SP)
                021030  012746  000002                                                  MOV     #2,-(SP)
                021034  010600                                                          MOV     SP,R0
                021036  104415                                                          TRAP    C$PNTX
                021040  062706  000006                                                  ADD     #6,SP
    243         021044                          PRINTX  #FMT6,LUR14,LUR15,LUR16,LUR17
                021044  013746  002320                                                  MOV     LUR17,-(SP)
                021050  013746  002316                                                  MOV     LUR16,-(SP)
                021054  013746  002314                                                  MOV     LUR15,-(SP)
                021060  013746  002312                                                  MOV     LUR14,-(SP)
                021064  012746  011613                                                  MOV     #FMT6,-(SP)
                021070  012746  000005                                                  MOV     #5,-(SP)
                021074  010600                                                          MOV     SP,R0
                021076  104415                                                          TRAP    C$PNTX
                021100  062706  000014                                                  ADD     #14,SP
    244         021104                          ENDMSG
                021104                                                          L10012:
                021104  104423                                                          TRAP    C$MSG
    245
    246
    247
    248
    249
```

```
                                .SBTTL  REPORT CODING SECTION


                                ;////////////////////////////////////////////////////////////////////////
                                ;/ THE REPORT CODING SECTION CONTAINS THE
                                ;/ "PRINTS" CALLS THAT GENERATE STATISTICAL REPORTS.
                                ;////////////////////////////////////////////////////////////////////////

021106                                  BGNRPT
021106                                                                  L$RPT::

021106                                  ENDRPT
021106                                                                  L10013:
021106  104425                                                                TRAP    C$RPT
```

LOAD DEVICE PROTECTION TABLE

```
                                .SBTTL  LOAD DEVICE PROTECTION TABLE

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

021110                                  BGNPROT
021110                                                                          L$PROT::
021110  177777                        .WORD   -1      ;DON'T CHK CSR ADRS
021112  177777                        .WORD   -1      ;DON'T CHK MASSBUS UNIT NO.
021114  177777                        .WORD   -1      ;DON'T CHK DRIVE NO.
021116                                  ENDPROT
```

```
                                .SBTTL  INITIALIZE SECTION

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

021116                                  BGNINIT
021116                                                                          L$INIT::

021116  010637  002346                  MOV     SP,PSTACK       ;SAVE BASE-LEVEL STACK POINTER
021122  005037  002352                  CLR     SUBRPC          ;CLEAR SUBR CALL PC
021126  005037  002426                  CLR     DISILO          ;CLEAR CURRENT STATE OF DISSI
021132  005037  002430                  CLR     CHPTYP          ;CLEAR USYRT CHIP TYPE INDICATOR
021136  005037  002420                  CLR     ERROR1          ;CLEAR ERROR FLAG
021142  005037  002432                  CLR     SAVLEN          ;CLEAR CHAR LENGTH FROM SETUP
021146  005737  002412                  TST     FRSTIM          ;SEE IF FIRST TIME THROUGH AFTER LOAD
021152  001007                          BNE     6$              ;BR IF NOT
021154  013737  000004  002414          MOV     @#4,SAVE4       ;SAVE ERROR TRAP VECTOR
021162  013737  000006  002416          MOV     @#6,SAVE6
021170  000406                          BR      9$
021172  013737  002414  000004  6$:     MOV     SAVE4,@#4       ;RESTORE ERROR TRAP VECTOR
021200  013737  002416  000006          MOV     SAVE6,@#6
021206  012737  000001  002412  9$:     MOV     #1,FRSTIM       ;MARK FLAG FOR NEXT TIME THROUGH
                        ;SEE IF PROGRAM JUST STARTED, BR IF YES
021214                                  READEF  #EF.START
021214  012700  000040                                                          MOV     #EF.START,R0
021220  104447                                                                  TRAP    C$REFG
021222                                  BCOMPLETE       STARST
021222  103415                                                                  BCS     STARST
                        ;SEE IF PROGRAM JUST RESTARTED, BR IF YES
021224                                  READEF  #EF.RESTART
021224  012700  000037                                                          MOV     #EF.RESTART,R0
021230  104447                                                                  TRAP    C$REFG
021232                                  BCOMPLETE       STARST
021232  103411                                                                  BCS     STARST
                        ;SEE IF THIS IS A NEW PASS, BR IF YES
021234                                  READEF  #EF.NEW
021234  012700  000035                                                          MOV     #EF.NEW,R0
021240  104447                                                                  TRAP    C$REFG
021242                                  BCOMPLETE       NEWST
021242  103411                                                                  BCS     NEWST
                        ;SEE IF PROGRAM WAS JUST CONTINUED
021244                                  READEF  #EF.CONTINUE
021244  012700  000036                                                          MOV     #EF.CONTINUE,R0
021250  104447                                                                  TRAP    C$REFG
021252                                  BCOMPLETE       ENDIT
021252  103504                                                                  BCS     ENDIT
021254  000414                          BR      GETPRM
021256                          STARST:
021256  005037  002444                  CLR     STARES          ;CLEAR FLAG TO SHOW JUST HAD STA OR RES
                        ;CLEAR DEVICE MAP
021262  005037  002434                  CLR     DEVMAP
021266                          NEWST:
021266  012737  177777  002344          MOV     #-1,LOGDEV      ;RESET LOGICAL DEVICE TO -1
021274  005237  002444                  INC     STARES          ;INCR NO. OF PASSES SINCE STA OR RES
021300  012737  000001  002436          MOV     #BIT0,DEVPTR    ;INIT DEVICE MAP BIT POINTER
```

```
                                        ; GET UNIBUS ADDRESS, VECTOR, PRIORITY LEVEL, SWITCH PACKS, TEST
                                        ;   CONNECTOR INFORMATION FOR THIS LOGICAL DEVICE
021306                                  GETPRM:
021306  005237  002344                          INC     LOGDEV          ;INCREMENT LOGICAL DEVICE NUMBER
021312  023737  002344  002012                  CMP     LOGDEV,L$UNIT   ;SEE IF MAXIMUM UNIT NO. EXCEEDED
021320  002362                                  BGE     NEWST           ;BR IF YES
021322                                          GPHARD  LOGDEV,R1       ;GET P-TABLE POINTER INTO R1
021322  013700  002344                                                          MOV     LOGDEV,R0
021326  104442                                                                  TRAP    C$GPHRD
021330  010001                                                                  MOV     R0,R1
021332                                          BCOMPLETE       10$     ;BR IF DEVICE AVAILABLE
021332  103403                                                                  BCS     10$
021334  006337  002436                          ASL     DEVPTR          ;SHIFT DEVICE POINTER
021340  000762                                  BR      GETPRM          ;SKIP THIS DEVICE
021342  053737  002436  002434  10$:            BIS     DEVPTR,DEVMAP   ;SET BIT FOR THIS DEVICE
021350  006337  002436                          ASL     DEVPTR          ;SHIFT BIT POINTER
021354  062701  000002                          ADD     #2,R1           ;INCREMENT R1 PAST MICROPROCESSOR TYPE
021360  011137  002446                          MOV     (R1),MPCSR      ;STORE POINTER TO MICROPROCESSOR CSR'S
021364  011137  002450                          MOV     (R1),BSEL1
021370  005237  002450                          INC     BSEL1           ;GET POINTER TO BSEL1 (MAINTENANCE REGISTER)
021374  013737  002450  002452                  MOV     BSEL1,BSEL2
021402  005237  002452                          INC     BSEL2           ;GET POINTER TO BSEL2
021406  011137  002454                          MOV     (R1),SEL4
021412  062737  000004  002454                  ADD     #4,SEL4         ;GET POINTER TO SEL4
021420  012137  002456                          MOV     (R1)+,SEL6
021424  062737  000006  002456                  ADD     #6,SEL6         ;STORE POINTER TO SEL6
021432  011137  002460                          MOV     (R1),MPIVEC     ;GET MICROPROCESSOR INPUT INTRPT VECTOR
021436  012137  002462                          MOV     (R1)+,MPOVEC
021442  062737  000004  002462                  ADD     #4,MPOVEC       ;GET MICROPROCESSOR OUTPUT INTRPT VECTOR
021450  012137  002464                          MOV     (R1)+,MPRIOR    ;GET MICROPROCESSOR DEVICE PRIORITY
021454  062701  000014                          ADD     #14,R1          ;POINT R1 TO RUN SWITCH INDICATOR
021460  011137  002476                          MOV     (R1),RUNINH     ;GET STATE OF MICROPROCESSOR RUN SWITCH
021464                                  ENDIT:
021464                                          ENDINIT
021464                                                                  L10015:
021464  104411                                                                  TRAP    C$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.
                        ;////////////////////////////////////////////////////////////////////////////
021466                          BGNAUTO
021466                                                                          L$AUTO::
                        ;ESTABLISH CPU PRIORITY = 7
021466                          SETPRI  #PRI07
021466  012700  000340                                                                  MOV     #PRI07,R0
021472  104441                                                                          TRAP    C$SPRI
021474  012737  021516  000004        MOV     #6$,@#4         ;SET UP NON-EXISTENT MEMORY ERROR TRAP VECTOR
021502  012737  000340  000006        MOV     #PRI07,@#6
021510  005777  160732                TST     @MPCSR          ;ADDRESS SELO
021514  000405                        BR      9$              ;TAKE THIS BR IF DEVICE RESPONDS
                        ;COME HERE IF DEVICE CSR IS NON-EXISTENT
021516  062706  000004        6$:     ADD     #4,SP           ;CLEAN UP THE STACK POINTER
021522                          DODU    LOGDEV          ;DROP THIS UNIT FROM TESTING
021522  013700  002344                                                                  MOV     LOGDEV,R0
021526  104451                                                                          TRAP    C$DODU
021530  013737  002414  000004  9$:     MOV     SAVE4,@#4       ;RESTORE ERROR TRAP VECTOR
021536  013737  002416  000006        MOV     SAVE6,@#6
021544                          ENDAUTO
021544                                                                          L10016:
021544  104461                                                                          TRAP    C$AUTO
```

CLEANUP CODING SECTION

```
                        .SBTTL  CLEANUP CODING SECTION

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

021546                          BGNCLN
021546                                                          L$CLEAN::

                        

021546                          ENDCLN
021546                                                          L10017:
021546  104412                                                          TRAP    C$CLEAN
```

DROP UNIT SECTION

```
                                .SBTTL  DROP UNIT SECTION

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

021550                                  BGNDU
021550                                                                  L$DU::
                                ;!SSUE UNIBUS RESET TO CLEAN UP
                                        BRESET
021550  104433                                                                  TRAP    C$RESET
                                ;PRINT ''UNIT XX DROPPED''
                                        PRINTF  #FMT27,LOGDEV
021552                                                                  MOV     LOGDEV,-(SP)
021552  013746  002344                                                  MOV     #FMT27,-(SP)
021556  012746  021600                                                  MOV     #2,-(SP)
021562  012746  000002                                                  MOV     SP,R0
021566  010600                                                          TRAP    C$PNTF
021570  104417                                                          ADD     #6,SP
021572  062706  000006
021576                                  ENDDU
021576                                                                  L10020:
021576  104453                                                                  TRAP    C$DU

021600  045  116  045  FMT27:  .ASCIZ  /%N%AUNIT %D2%A DROPPED%N/
021603  101  125  116
021606  111  124  040
021611  045  104  062
021614  045  101  040
021617  104  122  117
021622  120  120  105
021625  104  045  116
021630  000

                                .EVEN
```

ADD UNIT SECTION

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

 021632                         BGNAU
 021632                                                         L$AU::
 021632                         ENDAU
 021632                                                         L10021:
 021632  104452                                                         TRAP    C$AU
```

```
                        .SBTTL  HARDWARE TESTS
                        ;;*****************************************************************************
                        .SBTTL      TEST 1 - MICROPROCESSOR CSR ADDRESSING TEST (SEL0)
                        ;*
                        ;* THIS TEST ADDRESSES THE FIRST MICROPROCESSOR CSR (SEL0), TO MAKE SURE
                        ;* THAT A NON-EXISTENT MEMORY TIME-OUT TRAP DOES NOT OCCUR WHILE
                        ;* ATTEMPTING TO ADDRESS THE MICROPROCESSOR.
                        ;;*****************************************************************************
021634                  BGNTST
021634                                                                          T1::
                        ;ESTABLISH CPU PRIORITY = 7
021634                          SETPRI  #PRI07
021634  012700  000340                                                         MOV     #PRI07,R0
021640  104441                                                                 TRAP    C$SPRI
021642  012737  021664  000004          MOV     #6$,@#4         ;SET UP NON-EXISTENT MEMORY ERROR TRAP VECTOR
021650  012737  000340  000006          MOV     #PRI07,@#6
021656  005777  160564                  TST     @MPCSR          ;ADDRESS SEL0
021662  000406                          BR      9$              ;TAKE THIS BR IF DEVICE RESPONDS
                        ;COME HERE IF DEVICE CSR IS NON-EXISTENT
021664  062706  000004          6$:     ADD     #4,SP           ;CLEAN UP THE STACK POINTER
                        ;REPORT CSR ADDRESS TIME-OUT
021670                          ERRDF   1,EM1,ERR1
021670  104455                                                                 TRAP    C$ERDF
021672  000001                                                                 .WORD   1
021674  012125                                                                 .WORD   EM1
021676  014600                                                                 .WORD   ERR1
021700  013737  002414  000004  9$:     MOV     SAVE4,@#4       ;RESTORE ERROR TRAP VECTOR
021706  013737  002416  000006          MOV     SAVE6,@#6
021714                  ENDTST
021714                                                                  L10022:
021714  104401                                                                 TRAP    C$ETST


                        ;;*****************************************************************************
                        .SBTTL      TEST 2 - INBUS/OUTBUS REG 14 INITIALIZATION TEST
                        ;*
                        ;* MASTER CLEAR (MCLR) IS SET IN THE MICROPROCESSOR, IBUS REG 14 IS READ
                        ;* AND COMPARED TO 200.
                        ;;*****************************************************************************
021716                  BGNTST
021716                                                                          T2::
021716  012737  000014  002400          MOV     #14,REGNUM      ;SET LU REG NO. = 14
021724  004737  003576                  JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
021730  004737  003672                  JSR     PC,READLU       ;READ REG 14
021734  123737  002364  003026          CMPB    REDBYT,PATM+4   ;CHK FOR INITIALIZED STATE
021742  001416                          BEQ     6$              ;BR IF YES
021744  005037  002404                  CLR     GOODAT          ;SET EXPECTED REG CONTENTS - 000
021750  113737  003026  002404          MOVB    PATM+4,GOODAT   ;SET EXPECTED DATA
021756  013737  002364  002406          MOV     REDBYT,BADDAT   ;SET ACTUAL REG CONTENTS
```

```
     48 021764  004737  004016                    JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
     49                                ;REPORT REG NOT CLEARED BY MASTER CLEAR
     50 021770                                    ERRDF   2,EM2,ERR2
        021770  104455                                                                  TRAP    C$ERDF
        021772  000002                                                                  .WORD   2
        021774  012161                                                                  .WORD   EM2
        021776  014632                                                                  .WORD   ERR2
     51 022000                                6$:
     52 022000                                ENDTST
        022000                                                                L10023:
        022000  104401                                                                 TRAP    C$ETST
     53
     54
     55
     56
     57
     58                                ;;*************************************************************************
     59                                .SBTTL      TEST 3 - INBUS/OUTBUS REG 14 READ/WRITE BIT TEST
     60                                ;*
     61                                ;* WRITE, READ, AND COMPARE ALL WORDS OF DATA PATTERN A INTO REG 14,
     62                                ;* A BYTE AT A TIME. NON-R/W BITS ARE MASKED OFF TO 0 BEFORE WRITING AND
     63                                ;* READING.
     64                                ;*    DATA PATTERN A = 125,252,000,377,001,002,004,010,020,040,100,200,376,
     65                                ;*                     375,373,367,357,337,277,177.
     66                                ;;*************************************************************************
     67 022002                                BGNTST
        022002                                                                          T3::
     68 022002  004737  003576                    JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
     69 022006  012737  000014  002400            MOV     #14,REGNUM      ;SET LU REG NO. = 14
     70 022014  012701  002571                    MOV     #PATA,R1        ;GET POINTER TO DATA PAT IN R1
     71 022020                                3$:
     72 022020                                    BGNSEG
        022020  104404                                                                  TRAP    C$BSEG
     73 022022  111137  002366                    MOVB    (R1),WRIBYT     ;GET A BYTE OF PAT A
     74 022026  143737  002560  002366            BICB    R14NRW,WRIBYT   ;MASK OFF NON-READ/WRITE BITS
     75 022034  004737  003750                    JSR     PC,WRITLU       ;WRITE DATA BYTE INTO REG 14
     76 022040  004737  003672                    JSR     PC,READLU       ;READ DATA BYTE FROM REG 14
     77 022044  143737  002560  002364            BICB    R14NRW,REDBYT   ;MASK OFF NON-READ/WRITE BITS
     78 022052  123737  002364  002366            CMPB    REDBYT,WRIBYT   ;COMPARE BYTE READ TO BYTE WRITTEN
     79 022060  001414                            BEQ     6$              ;BR IF BYTES MATCH
     80 022062  013737  002366  002404            MOV     WRIBYT,GOODAT   ;SET EXPECTED REG CONTENTS
     81 022070  013737  002364  002406            MOV     REDBYT,BADDAT   ;SET ACTUAL REG CONTENTS
     82 022076  004737  004016                    JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
     83                                ;REPORT LINE UNIT REG MISCOMPARE
     84 022102                                    ERRDF   3,EM3,ERR2
        022102  104455                                                                  TRAP    C$ERDF
        022104  000003                                                                  .WORD   3
        022106  012220                                                                  .WORD   EM3
        022110  014632                                                                  .WORD   ERR2
     85 022112                                6$:
     86 022112                                    ENDSEG
        022112                                                                10000$:
        022112  104405                                                                 TRAP    C$ESEG
     87 022114  005201                            INC     R1              ;INCREMENT DATA PATTERN POINTER
     88 022116  020127  002615                    CMP     R1,#PATB        ;SEE IF ALL WORDS OF PATTERN A USED YET
     89 022122  103736                            BLO     3$              ;BR IF NOT DONE YET
     90 022124                                FNDTST
```

```
                022124                                                          L10024:
                022124  104401                                                          TRAP    C$ETST
                91
                92
                93
                94
                95
                96                      ;;*************************************************************************
                97                      .SBTTL      TEST 4 - REG 14 MASTER CLEAR TEST
                98                      ;* WRITE 377 INTO REG 14, ISSUE MASTER CLEAR, READ REG 14 AND COMPARE
                99                      ;* TO 200.
               100                      ;;*************************************************************************
               101 022126               BGNTST
                022126                                                                  T4::
               102 022126  004737  003576              JSR     PC,MSTCLR       ;PERFORM MASTER CLEAR
               103 022132  012737  000014  002400      MOV     #14,REGNUM      ;SET LU REG NO. = 14
               104 022140  112737  000377  002366      MOVB    #377,WRIBYT     ;SET DATA BYTE = 377
               105 022146  004737  003750              JSR     PC,WRITLU       ;WRITE 377 INTO REG 14
               106 022152  004737  003576              JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
               107 022156  004737  003672              JSR     PC,READLU       ;READ REG 14
               108 022162  123737  002364  003026      CMPB    REDBYT,PATM+4   ;CHK FOR INIT'D STATE
               109 022170  001416                      BEQ     6$              ;BR IF REG GOT CLEARED
               110 022172  005037  002404              CLR     GOODAT
               111 022176  113737  003026  002404      MOVB    PATM+4,GOODAT   ;SET EXPECTED DATA
               112 022204  013737  002364  002406      MOV     REDBYT,BADDAT   ;SET ACTUAL DATA
               113 022212  004737  004016              JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
               114                      ;REPORT REG NOT CLEARED BY MASTER CLEAR
               115 022216               ERRDF   2,EM2,ERR2
                022216  104455                                                          TRAP    C$ERDF
                022220  000002                                                          .WORD   2
                022222  012161                                                          .WORD   EM2
                022224  014632                                                          .WORD   ERR2
               116 022226               6$:
               117 022226               ENDTST
                022226                                                          L10025:
                022226  104401                                                          TRAP    C$ETST
               118
               119
               120
               121
               122
               123                      ;;*************************************************************************
               124                      .SBTTL      TEST 5 - REG 14 UNIBUS RESET (INIT) TEST
               125                      ;* WRITE 377 INTO REG 14, ISSUE UNIBUS RESET (INIT), READ REG 14 AND COMPARE
               126                      ;* TO 200.
               127                      ;;*************************************************************************
               128 022230               BGNTST
                022230                                                                  T5::
               129 022230  004737  003576              JSR     PC,MSTCLR       ;PERFORM MASTER CLEAR
               130 022234  012737  000014  002400      MOV     #14,REGNUM      ;SET LU REG NO. = 14
               131 022242  112737  000377  002366      MOVB    #377,WRIBYT     ;SET DATA BYTE = 377
               132 022250  004737  003750              JSR     PC,WRITLU       ;WRITE 377 INTO REG 14
               133 022254               BRESET                          ;ISSUE UNIBUS RESET (INIT)
                022254  104433                                                          TRAP    C$RESET
               134 022256  142777  000200  160164      BICB    #RUN,@BSEL1     ;CLEAR RUN BIT
               135 022264  012701  000024              MOV     #20.,R1         ;INIT LOOP COUNTER
               136 022270  000240              2$:     NOP
```

TEST 5 - REG 14 UNIBUS RESET (INIT) TEST

```
    137 022272  005301                        DEC     R1              ;DECR COUNTER
    138 022274  001375                        BNE     2$              ;BR TO STALL
    139 022276  004737  003672                JSR     PC,READLU       ;READ REG 14
    140 022302  142737  000100  002364        BICB    #TXEN,REDBYT    ;CLEAR UNPREDICTABLE BIT
    141 022310  123737  002364  003026        CMPB    REDBYT,PATM+4   ;CHK FOR INIT'D STATE
    142 022316  001416                        BEQ     6$              ;BR IF REG GOT CLEARED
    143 022320  005037  002404                CLR     GOODAT
    144 022324  113737  003026  002404        MOVB    PATM+4,GOODAT   ;SET EXPECTED DATA
    145 022332  013737  002364  002406        MOV     REDBYT,BADDAT   ;SET ACTUAL DATA
    146 022340  004737  004016                JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
    147                             ;REPORT REG NOT CLEARED BY UNIBUS RESET (INIT)
    148 022344                              ERRDF   4,EM4,ERR2
        022344  104455                                                  TRAP    C$ERDF
        022346  000004                                                  .WORD   4
        022350  012237                                                  .WORD   EM4
        022352  014632                                                  .WORD   ERR2
    149 022354                          6$:
    150 022354                          ENDTST
        022354                                                      L10026:
        022354  104401                                                  TRAP    C$ETST
    151
    152
    153
    154
    155
    156                             ;;**********************************************************************************
    157                             .SBTTL      TEST 6 - LINE UNIT FALSE SELECTION TEST
    158                             ;*
    159                             ;* FIRST, A MASTER CLEAR IS PERFORMED. THEN, THE PROGRAM SINGLE-STEPS THE
    160                             ;* MICROPROCESSOR THROUGH AN INSTRUCTION WHICH LOADS 041 (OCT) INTO THE MAR
    161                             ;* REGISTER (OBUS* ADRS 14). THEN, THE LINE UNIT REGISTER 14 IS READ AND CHECKED
    162                             ;* TO BE UNAFFECTED (STILL = 0). THIS TEST IS INTENDED TO DETECT A FALSE
    163                             ;* SELECTION OF THE LINE UNIT REGISTERS, WHEN THE LINE UNIT IS NOT BEING
    164                             ;* ACCESSED.
    165                             ;;**********************************************************************************
    166 022356                          BGNTST
        022356                                                          T6::
    167 022356  004737  003576                  JSR     PC,MSTCLR       ;ISSUE A MASTER CLEAR
    168 022362  012737  000014  002400          MOV     #14,REGNUM      ;SET LU REG NO. = 14
    169 022370  013701  002400                  MOV     REGNUM,R1       ;SET DESTINATION = OBUS* REG 14
    170 022374  052701  000100                  BIS     #100,R1         ;SET SOURCE = BSEL4
    171 022400  052701  121000                  BIS     #MVIXOX,R1      ;SET REST OF MOVE INSTRUCTION
    172 022404  010137  022422                  MOV     R1,2$           ;SET INSTRUCTION AS SUBROUTINE ARGUMENT
    173 022410  112777  000041  160036          MOVB    #041,@BSEL4     ;SET DATA BYTE = 041
    174 022416  004737  003540                  JSR     PC,STPCLK       ;EXECUTE MOVE INSTRUCTION
    175 022422  000000                  2$:     .WORD   0               ;INSTRUCTION GOES HERE
    176 022424  004737  003672                  JSR     PC,READLU       ;READ LU REG 14
    177 022430  123737  002364  003026          CMPB    REDBYT,PATM+4   ;CHECK FOR LU REG 14 UNCHANGED
    178 022436  001416                          BEQ     4$              ;BR IF LU REG 14 UNCHANGED
    179 022440  005037  002404                  CLR     GOODAT          ;SET EXPECTED DATA
    180 022444  113737  003026  002404          MOVB    PATM+4,GOODAT
    181 022452  013737  002364  002406          MOV     REDBYT,BADDAT   ;SET ACTUAL DATA
    182 022460  004737  004016                  JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
    183                             ;REPORT REGISTER MISCOMPARE
    184 022464                              ERRDF   3,EM3,ERR2
        022464  104455                                                  TRAP    C$ERDF
        022466  000003                                                  .WORD   3
```

```
TEST 6 - LINE UNIT FALSE SELECTION TEST

        022470  012220                                                          .WORD   EM3
        022472  014632                                                          .WORD   ERR2
    185 022474                          4$:
    186 022474                          ENDTST
        022474                                                          L10027:
        022474  104401                                                          TRAP    C$ETST
    187
    188
    189
    190
    191
    192                                 ;:*****************************************************************************
    193                                 .SBTTL      TEST 7 - INBUS REG MASTER CLEAR TEST
    194                                 ;*
    195                                 ;* FIRST, ALL READ/WRITE BITS OF REGS 10-17 ARE SET BY LOADING A
    196                                 ;* DIFFERENT WORD OF PATTERN G INTO EACH REG.  THEN,
    197                                 ;* A MASTER CLEAR IS ISSUED AND EACH REG IS READ AND COMPARED TO A WORD OF
    198                                 ;* PATTERN M, WHICH CONTAINS THE INITIALIZED STATES OF THE REGS. (UNPREDICTABLE
    199                                 ;* BITS ARE MASKED OFF TO 0 BEFORE COMPARISON).
    200                                 ;*   PATTERN G = 000,000,240,120,177,000,000,001
    201                                 ;*   PATTERN M = 000,020,000,000,200,000,000,051
    202                                 ;:*****************************************************************************
    203 022476                          BGNTST
        022476                                                                  T7::
    204 022476  004737  003576                  JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
    205 022502  012737  000010  002400          MOV     #10,REGNUM      ;INIT REG NO. TO 10
    206 022510  012701  002644                  MOV     #PATG,R1        ;INIT DATA PATTERN POINTER
    207 022514  112137  002366          2$:     MOVB    (R1)+,WRIBYT    ;SET DATA PATTERN BYTE TO BE WRITTEN
    208 022520  004737  003750                  JSR     PC,WRITLU       ;WRITE BYTE INTO REG
    209 022524  005237  002400                  INC     REGNUM          ;INCREMENT REG NO. FOR WRITING
    210 022530  020127  002654                  CMP     R1,#PATH        ;SEE IF ALL BYTES WRITTEN YET
    211 022534  103767                          BLO     2$              ;BR IF NOT DONE WRITING YET
    212 022536  004737  003576                  JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
    213 022542  012737  000010  002400          MOV     #10,REGNUM      ;INIT LU REG NO. TO 10
    214 022550  012702  003022                  MOV     #PATM,R2        ;INIT DATA PATTERN POINTER
    215 022554  012701  002550                  MOV     #UPBITS,R1      ;INIT POINTER TO UNPREDICTABLE BITS
    216 022560                          3$:
    217 022560  004737  003672                  JSR     PC,READLU       ;READ A LINE UNIT REG
    218 022564  142137  002364                  BICB    (R1)+,REDBYT    ;MASK OUT UNPREDICTABLE BITS FOR THIS REG
    219 022570  123712  002364                  CMPB    REDBYT,(R2)     ;COMPARE MASKED DATA TO EXPECTED
    220 022574  001417                          BEQ     6$              ;BR IF DATA READ IS OK
    221 022576  005037  002404                  CLR     GOODAT
    222 022602  111237  002404                  MOVB    (R2),GOODAT     ;SET EXPECTED DATA
    223 022606  013737  002364  002406          MOV     REDBYT,BADDAT   ;SET ACTUAL DATA
    224 022614  004737  004016                  JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
    225                                 ;REPORT REG NOT CLEARED BY MASTER CLEAR
    226 022620                                  ERRDF   2,EM2,ERR2
        022620  104455                                                          TRAP    C$ERDF
        022622  000002                                                          .WORD   2
        022624  012161                                                          .WORD   EM2
        022626  014632                                                          .WORD   ERR2
    227 022630                                  ESCAPE  TST
        022630  104410                                                          TRAP    C$ESCAPE
        022632  000016                                                          .WORD   L10030-.
    228 022634  005237  002400          6$:     INC     REGNUM          ;INCREMENT REG NO.
    229 022640  005202                          INC     R2              ;INCR DATA PATTERN POINTER
    230 022642  020227  003032                  CMP     R2,#PATN        ;SEE IF ALL DONE YET
```

```
                        BLO     3$              ;BR IF NOT DONE YET
                ENDTST
022650                                                          L10030:
022650 104401                                                           TRAP    C$ETST
                ;;*************************************************************************
                .SBTTL      TEST 8 - REGISTER 10-17 ADDRESSING TEST
                ;*
                ;* FIRST, A MASTER CLEAR IS ISSUED. THEN,
                ;* WRITE A DIFFERENT WORD OF DATA PATTERN B INTO EACH OF REGS 10-17,
                ;* AND AFTER EACH WRITE, READ AND COMPARE ALL REGS TO EXPECTED VALUES.
                ;* UNPREDICTABLE BITS ARE MASKED OFF TO 0 WHEN READ FOR COMPARISON.
                ;*    PATTERN B = 000,000,040,100,220,000,000,051
                ;;*************************************************************************
                BGNTST
022652                                                                  T8::
022652 004737 003576            JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
022656 012701 002500            MOV     #REDDAT,R1      ;INIT POINTER TO EXPECTED DATA AREA
022662 012702 003022            MOV     #PATM,R2        ;GET POINTER TO PATTERN M
022666 012703 000010            MOV     #8.,R3          ;SET COUNTER
022672 112221            3$:    MOVB    (R2)+,(R1)+     ;LOAD BYTE OF PATRN INTO EXPECTED DATA AREA
022674 005303                   DEC     R3              ;DECR COUNTER
022676 001375                   BNE     3$              ;BR IF NOT DONE LOADING YET
023000 005001                   CLR     R1              ;INIT DATA PATTERN INDEX FOR WRITING
023002 010137 002400     6$:    MOV     R1,REGNUM
023006 062737 000010 002400     ADD     #10,REGNUM      ;GET REG NO. FOR WRITING
023014 116137 002615 002366     MOVB    PATB(R1),WRIBYT ;SET DATA BYTE TO BE WRITTEN
023022 113761 002366 002500     MOVB    WRIBYT,REDDAT(R1) ;SET EXPECTED DATA FOR READ
023030 146161 002550 002500     BICB    UPBITS(R1),REDDAT(R1) ;MASK OUT UNPREDICTABLE BITS
023036 004737 003750            JSR     PC,WRITLU       ;WRITE DATA BYTE INTO REG
023042 005003                   CLR     R3              ;INIT DATA PAT INDEX FOR READS
023044 010337 002400     9$:    MOV     R3,REGNUM
023050 062737 000010 002400     ADD     #10,REGNUM      ;GET REG NO. FOR READING
023056 004737 003672            JSR     PC,READLU       ;READ A LINE UNIT REG
023062 146337 002550 002364     BICB    UPBITS(R3),REDBYT ;MASK OUT UNPREDICTABLE BITS
023070 023727 002400 000011     CMP     REGNUM,#11      ;SEE IF READING REG 11
023076 001006                   BNE     10$             ;BR IF NOT
023100 142737 000020 002364     BICB    #ORDY,REDBYT    ;MASK ORDY BIT IN ACTUAL BYTE
023106 142763 000020 002500     BICB    #ORDY,REDDAT(R3) ;MASK ORDY BIT IN EXPECTED BYTE
023114 123763 002364 002500 10$:CMPB    REDBYT,REDDAT(R3) ;COMPARE BYTE READ TO EXPECTED
023122 001420                   BEQ     12$             ;BR IF DATA MATCHES
023124 005037 002404            CLR     GOODAT
023130 116337 002500 002404     MOVB    REDDAT(R3),GOODAT ;SET EXPECTED DATA
023136 013737 002364 002406     MOV     REDBYT,BADDAT   ;SET ACTUAL DATA
023144 004737 004016            JSR     PC,GETREG       ;READ AND STORE REGS 10-17 FOR PRINTOUT
                ;REPORT REG MISCOMPARE
                ERRDF   3,EM3,ERR2
023050                                                                  TRAP    C$ERDF
023050 104455                                                           .WORD   3
023052 000003                                                           .WORD   EM3
023054 012220                                                           .WORD   ERR2
023056 014632
                ESCAPE  TST
023060                                                                  TRAP    C$ESCAPE
023060 104410
```

```
023062  000022                                                          .WORD   L10031-.
280 023064  005203          12$:    INC     R3              ;INCREMENT DATA PATTERN INDEX FOR READING
281 023066  020327  000010          CMP     R3,#10          ;SEE IF ALL REGS READ YET
282 023072  002724                  BLT     9$              ;BR IF NOT
283 023074  005201                  INC     R1              ;INCREMENT DATA PAT INDEX FOR WRITING
284 023076  020127  000010          CMP     R1,#10          ;SEE IF ALL REGS WRITTEN YET
285 023102  002677                  BLT     6$              ;BR IF NOT
286 023104                  ENDTST
023104                                                                  L10031:
023104  104401                                                                  TRAP    C$ETST
287
288
289
290
291
292                         ;;*************************************************************************
293                         .SBTTL      TEST 9 - REG 11 READ/WRITE BIT TEST
294                         ;*
295                         ;* WRITE, READ, AND COMPARE EACH WORD OF DATA PATTERN C INTO REG 11 :
296                         ;*     DATA PATTERN C = 020,020,020.
297                         ;;*************************************************************************
298 023106                  BGNTST
023106                                                                  T9::
299 023106  004737  003576          JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
300 023112  012737  000011  002400  MOV     #11,REGNUM      ;SET LU REG NO. = 11
301 023120  012701  002625          MOV     #PATC,R1        ;GET POINTER TO DATA PAT IN R1
302 023124                  3$:
303 023124                          BGNSEG
023124  104404                                                                  TRAP    C$BSEG
304 023126  111137  002366          MOVB    (R1),WRIBYT     ;GET A BYTE OF PAT C
305 023132  004737  003750          JSR     PC,WRITLU       ;WRITE DATA BYTE INTO REG 11
306 023136  004737  003672          JSR     PC,READLU       ;READ DATA BYTE FROM REG 11
307 023142  143737  002551  002364  BICB    UPBITS+1,REDBYT ;MASK OUT UNPREDICTABLE BITS
308 023150  123737  002364  002366  CMPB    REDBYT,WRIBYT   ;COMPARE BYTE READ TO BYTE WRITTEN
309 023156  001414                  BEQ     6$              ;BR IF BYTES MATCH
310 023160  013737  002366  002404  MOV     WRIBYT,GOODAT   ;SET EXPECTED REG CONTENTS
311 023166  013737  002364  002406  MOV     REDBYT,BADDAT   ;SET ACTUAL REG CONTENTS
312 023174  004737  004016          JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
313                         ;REPORT LINE UNIT REG MISCOMPARE
314 023200                          ERRDF   3,EM3,ERR2
023200  104455                                                                  TRAP    C$ERDF
023202  000003                                                                  .WORD   3
023204  012220                                                                  .WORD   EM3
023206  014632                                                                  .WORD   ERR2
315 023210                  6$:
316 023210                          ENDSEG
023210                                                                  10000$:
023210  104405                                                                  TRAP    C$ESEG
317 023212  005201                  INC     R1              ;INCREMENT DATA PATTERN POINTER
318 023214  020127  002630          CMP     R1,#PATD        ;SEE IF ALL WORDS OF PATTERN C USED YET
319 023220  103741                  BLO     3$              ;BR IF NOT DONE YET
320 023222                  ENDTST
023222                                                                  L10032:
023222  104401                                                                  TRAP    C$ETST
321
322
323
```

```
                                ;;*************************************************************************
                                .SBTTL      TEST 10 - REG 12 READ/WRITE BIT TEST
                                ;*
                                ;* WRITE, READ, AND COMPARE EACH WORD OF DATA PATTERN D INTO REG 12 :
                                ;*     DATA PATTERN D = 000,040,000.
                                ;;*************************************************************************
023224                          BGNTST
023224                                                                          T10::
023224  004737  003576                  JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
023230  012737  000012  002400          MOV     #12,REGNUM      ;SET LU REG NO. = 12
023236  012701  002630                  MOV     #PATD,R1        ;GET POINTER TO DATA PAT IN R1
023242                          3$:
023242                                  BGNSEG
023242  104404                                                                  TRAP    C$BSEG
023244  111137  002366                  MOVB    (R1),WRIBYT     ;GET A BYTE OF PAT D
023250  004737  003750                  JSR     PC,WRITLU       ;WRITE DATA BYTE INTO REG 12
023254  004737  003672                  JSR     PC,READLU       ;READ DATA BYTE FROM REG 12
023260  143737  002552  002364          BICB    UPBITS+2,REDBYT ;MASK OUT UNPREDICTABLE BITS
023266  123737  002364  002366          CMPB    REDBYT,WRIBYT   ;COMPARE BYTE READ TO BYTE WRITTEN
023274  001414                          BEQ     6$              ;BR IF BYTES MATCH
023276  013737  002366  002404          MOV     WRIBYT,GOODAT   ;SET EXPECTED REG CONTENTS
023304  013737  002364  002406          MOV     REDBYT,BADDAT   ;SET ACTUAL REG CONTENTS
023312  004737  004016                  JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
                                ;REPORT LINE UNIT REG MISCOMPARE
023316                                  ERRDF   3,EM3,ERR2
023316  104455                                                                  TRAP    C$ERDF
023320  000003                                                                  .WORD   3
023322  012220                                                                  .WORD   EM3
023324  014632                                                                  .WORD   ERR2
023326                          6$:
023326                                  ENDSEG
023326                                                                  10000$:
023326  104405                                                                  TRAP    C$ESEG
023330  005201                          INC     R1              ;INCREMENT DATA PATTERN POINTER
023332  020127  002633                  CMP     R1,#PATE        ;SEE IF ALL WORDS OF PATTERN D USED YET
023336  103741                          BLO     3$              ;BR IF NOT DONE YET
023340                          ENDTST
023340                                                                  L10033:
023340  104401                                                                  TRAP    C$ETST
                                ;;*************************************************************************
                                .SBTTL      TEST 11 - REG 13 READ/WRITE BIT TEST
                                ;*
                                ;* WRITE, READ, AND COMPARE EACH WORD OF DATA PATTERN E INTO REG 13 :
                                ;*     DATA PATTERN E = 000,120,020,100,120,000.
                                ;;*************************************************************************
023342                          BGNTST
023342                                                                          T11::
023342  004737  003576                  JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
023346  012737  000013  002400          MOV     #13,REGNUM      ;SET LU REG NO. = 13
023354  012701  002633                  MOV     #PATE,R1        ;GET POINTER TO DATA PAT IN R1
```

TEST 11 - REG 13 READ/WRITE BIT TEST

```
                                3$:
                                        BGNSEG
                                                                                        TRAP    C$BSEG
023360  104404
372 023362  111137  002366                MOVB    (R1),WRIBYT     ;GET A BYTE OF PAT E
373 023366  004737  003750                JSR     PC,WRITLU       ;WRITE DATA BYTE INTO REG 13
374 023372  004737  003672                JSR     PC,READLU       ;READ DATA BYTE FROM REG 13
375 023376  143737  002553  002364        BICB    UPBITS+3,REDBYT ;MASK OUT UNPREDICTABLE BITS
376 023404  123737  002364  002366        CMPB    REDBYT,WRIBYT   ;COMPARE BYTE READ TO BYTE WRITTEN
377 023412  001414                        BEQ     6$              ;BR IF BYTES MATCH
378 023414  013737  002366  002404        MOV     WRIBYT,GOODAT   ;SET EXPECTED REG CONTENTS
379 023422  013737  002364  002406        MOV     REDBYT,BADDAT   ;SET ACTUAL REG CONTENTS
380 023430  004737  004016                JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
381                             ;REPORT LINE UNIT REG MISCOMPARE
382 023434                              ERRDF   3,EM3,ERR2
023434  104455                                                                        TRAP    C$ERDF
023436  000003                                                                      .WORD   3
023440  012220                                                                      .WORD   EM3
023442  014632                                                                      .WORD   ERR2
383 023444                      6$:
384 023444                              ENDSEG
023444                                                                          10000$:
023444  104405                                                                      TRAP    C$ESEG
385 023446  005201                        INC     R1              ;INCREMENT DATA PATTERN POINTER
386 023450  020127  002641                CMP     R1,#PATF        ;SEE IF ALL WORDS OF PATTERN E USED YET
387 023454  103741                        BLO     3$              ;BR IF NOT DONE YET
388 023456                      ENDTST
023456                                                                          L10034:
023456  104401                                                                      TRAP    C$ETST
389
390
391
392
393
394                             ;;*************************************************************************************
395                             .SBTTL      TEST 12 - REG 17 READ/WRITE BIT TEST
396                             ;*
397                             ;* WRITE, READ, AND COMPARE EACH WORD OF DATA PATTERN F INTO REG 17 :
398                             ;*     DATA PATTERN F = 050,051,050.
399                             ;;*************************************************************************************
400 023460                      BGNTST
023460                                                                              T12::
401 023460  004737  003576                JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
402 023464  012737  000017  002400        MOV     #17,REGNUM      ;SET LU REG NO. = 17
403 023472  012701  002641                MOV     #PATF,R1        ;GET POINTER TO DATA PAT IN R1
404 023476                      3$:
405 023476                              BGNSEG
023476  104404                                                                        TRAP    C$BSEG
406 023500  111137  002366                MOVB    (R1),WRIBYT     ;GET A BYTE OF PAT F
407 023504  004737  003750                JSR     PC,WRITLU       ;WRITE DATA BYTE INTO REG 17
408 023510  004737  003672                JSR     PC,READLU       ;READ DATA BYTE FROM REG 17
409 023514  143737  002557  002364        BICB    UPBITS+7,REDBYT ;MASK OUT UNPREDICTABLE BITS
410 023522  123737  002364  002366        CMPB    REDBYT,WRIBYT   ;COMPARE BYTE READ TO BYTE WRITTEN
411 023530  001414                        BEQ     6$              ;BR IF BYTES MATCH
412 023532  013737  002366  002404        MOV     WRIBYT,GOODAT   ;SET EXPECTED REG CONTENTS
413 023540  013737  002364  002406        MOV     REDBYT,BADDAT   ;SET ACTUAL REG CONTENTS
414 023546  004737  004016                JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
415                             ;REPORT LINE UNIT REG MISCOMPARE
```

```
    416 023552                          ERRDF   3,EM3,ERR2
        023552  104455                                                  TRAP    C$ERDF
        023554  000003                                                  .WORD   3
        023556  012220                                                  .WORD   EM3
        023560  014632                                                  .WORD   ERR2
    417 023562                      6$:
    418 023562                          ENDSEG
        023562                                                      10000$:
        023562  104405                                                  TRAP    C$ESEG
    419 023564  005201                  INC     R1              ;INCREMENT DATA PATTERN POINTER
    420 023566  020127  002644          CMP     R1,#PATG        ;SEE IF ALL WORDS OF PATTERN F USED YET
    421 023572  103741                  BLO     3$              ;BR IF NOT DONE YET
    422 023574                      ENDTST
        023574                                                      L10035:
        023574  104401                                                  TRAP    C$ETST
    423
    424
    425
    426
    427
    428                             ;;*************************************************************************
    429                             .SBTTL      TEST 13 - MAINTENANCE CLOCK BIT TEST
    430                             ;*
    431                             ;* FIRST, A MASTER CLEAR IS ISSUED TO INIT ALL REGS. THEN, THE MICROPROCESSOR
    432                             ;* IS PLACED IN A LOOP ON AN INSTRUCTION, BY SETTING THE INSTRUCTION IN SEL6
    433                             ;* AND SETTING ROMI AND RUN IN BSEL1. THE INSTRUCTION IS ONE WHICH REPETITIVELY
    434                             ;* READS LINE UNIT REG 17 INTO BSEL2. THE PDP-11 CAN THEN SCAN BSEL2 TO MONITOR
    435                             ;* THE MAINTENANCE CLOCK BIT, MCLK. THE FOLLOWING SEQUENCE IS THEN PERFORMED
    436                             ;* TO MONITOR MCLK :
    437                             ;* - THE PROGRAM REPEATEDLY CHECKS THE MCLK BIT FOR THE 1 STATE, AND IF IT IS
    438                             ;*   NOT FOUND WITHIN SEVERAL HUNDRED MILLI-SEC (DEPENDING ON THE PROCESSOR)
    439                             ;*   AN ERROR IS REPORTED. (THE MAINTENANCE CLOCK HAS A PERIOD OF 41.6 MICRO-
    440                             ;*   SEC).
    441                             ;* - THE PROGRAM NEXT REPEATEDLY CHECKS THE MCLK BIT FOR THE 0 STATE, AND IF
    442                             ;*   IT IS NOT FOUND WITHIN SEVERAL HUNDRED MILLI-SEC AN ERROR IS REPORTED.
    443                             ;* - THE PROGRAM NEXT REPEATEDLY CHECKS MCLK BIT FOR THE 1 STATE AGAIN, AND
    444                             ;*   IF IT IS NOT FOUND WITHIN SEVERAL HUNDRED MILLI-SEC, AN ERROR IS REPORTED.
    445                             ;*
    446                             ;* IF THE P-TABLE FOR THIS UNIT INDICATES THAT THE M8207 RUN SWITCH (E28 SW7)
    447                             ;* IS OFF, THE TEST WILL BE SKIPPED.
    448                             ;*************************************************************************
    449 023576                      BGNTST
        023576                                                          T13::
    450 023576  004737  003576              JSR     PC,MSTCLR       ;PERFORM MASTER CLEAR
    451 023602  012737  000015  002442      MOV     #13.,TSTNUM     ;SET TEST NO.
    452 023610  005737  002476              TST     RUNINH          ;SEE IF RUN SWITCH IS SET
    453 023614  001020                      BNE     1$              ;BR IF YES, TO RUN TEST
    454 023616  023727  002444  000001      CMP     STARES,#1       ;SEE IF THIS IS FIRST PASS SINCE STA OR RES
    455 023624  001012                      BNE     40$             ;BR IF NOT, TO SKIP PRINTING
    456 023626                              PRINTF  #FMT19,TSTNUM   ;PRINT MSG TO SAY TEST NOT RUN
        023626  013746  002442                                                  MOV     TSTNUM,-(SP)
        023632  012746  012007                                                  MOV     #FMT19,-(SP)
        023636  012746  000002                                                  MOV     #2,-(SP)
        023642  010600                                                          MOV     SP,R0
        023644  104417                                                          TRAP    C$PNTF
        023646  062706  000006                                                  ADD     #6,SP
    457 023652  000137  024220          40$:    JMP     A1              ;GO TO SKIP TEST
```

TEST 13 - MAINTENANCE CLOCK BIT TEST

```
                                1$:     MOV     #17,REGNUM      ;SET REG NO. = 17
                                        MOV     #360,R1         ;SET INSTRUCTION SOURCE = INBUS REG 17
                                        BIS     #2,R1           ;SET INSTRUCTION DESTINATION = BSEL2
                                        BIS     #MVIOX,R1       ;SET REST OF MOVE INSTRUCTION
                                        MOV     R1,2$           ;SET INSTRUCTION AS SUBROUTINE ARGUMENT
                                        JSR     PC,LOOPIN       ;GET MICROPROCESSOR LOOPING ON MOVE INSTRUCTION
                                2$:     .WORD   0               ;INSTRUCTION GOES HERE

                                ;-------------------------------------------------------------------------------
                                ; WAIT FOR MCLK BIT TO BE SET TO 1
                                ;-------------------------------------------------------------------------------

                                        CLR     REG0            ;INIT PROGRAM TIMER
                                3$:     MOVB    @BSEL2,REDBYT   ;GET REG 17 INTO REDBYT
                                        BITB    #MCLK,REDBYT    ;SEE IF MCLK BIT = 1 YET
                                        BNE     6$              ;BR IF MCLK = 1
                                        INC     REG0            ;INCREMENT TIMER
                                        BNE     3$              ;BR IF PROGRAM TIMER DID NOT TIME OUT YET
                                                                ; (TIME OUT = SEVERAL HUNDRED MILLI-SEC)
                                        MOV     #MCLK,GOODAT    ;SET EXPECTED REG CONTENTS
                                        MOV     REDBYT,BADDAT   ;SET ACTUAL REG CONTENTS
                                        JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
                                ;REPORT MCLK BIT STUCK AT 0
                                        ERRDF   5,EM5,ERR2
023762  104455                                                                    TRAP    C$ERDF
023764  000005                                                                    .WORD   5
023766  012312                                                                    .WORD   EM5
023770  014632                                                                    .WORD   ERR2
                                ;TYPE "PLEASE INSURE M8207 RUN SWITCH (E28 SW7) IS ON"
                                        PRINTF  #FMT24
023772  012746  012040                                                          MOV     #FMT24,-(SP)
023776  012746  000001                                                          MOV     #1,-(SP)
024002  010600                                                                  MOV     SP,R0
024004  104417                                                                  TRAP    C$PNTF
024006  062706  000004                                                          ADD     #4,SP
024012  000137  024220                        JMP     A1              ;ESCAPE TO END OF TEST

                                ;-------------------------------------------------------------------------------
                                ; WAIT FOR MCLK BIT TO BE CLEARED TO 0
                                ;-------------------------------------------------------------------------------
                                6$:
                                        CLR     REG0            ;INIT PROGRAM TIMER
                                8$:     MOVB    @BSEL2,REDBYT   ;GET REG 17 INTO REDBYT
                                        BITB    #MCLK,REDBYT    ;SEE IF MCLK BIT = 0 YET
                                        BEQ     10$             ;BR IF MCLK = 0
                                        INC     REG0            ;INCREMENT TIMER
                                        BNE     8$              ;BR IF TIMER DID NOT TIME OUT YET
                                        CLR     GOODAT          ;SET EXPECTED REG CONTENTS
                                        MOV     REDBYT,BADDAT   ;SET ACTUAL REG CONTENTS
                                        JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
                                ;REPORT MCLK BIT STUCK AT 1
                                        ERRDF   6,EM6,ERR2
024064  104455                                                                    TRAP    C$ERDF
024066  000006                                                                    .WORD   6
024070  012343                                                                    .WORD   EM6
024072  014632                                                                    .WORD   ERR2
                                ;TYPE "PLEASE INSURE M8207 RUN SWITCH (E28 SW7) IS ON"
                                        PRINTF  #FMT24
```

```
                024074  012746  012040                                                          MOV     #FMT24,-(SP)
                024100  012746  000001                                                          MOV     #1,-(SP)
                024104  010600                                                                  MOV     SP,R0
                024106  104417                                                                  TRAP    C$PNTF
                024110  062706  000004                                                          ADD     #4,SP
    502         024114  000137  024220                  JMP     A1              ;ESCAPE TO END OF TEST
    503
    504                                               ;-------------------------------------------------------------------------------
    505                                               ; WAIT FOR MCLK BIT TO BE SET TO 1 AGAIN
    506                                               ;-------------------------------------------------------------------------------
    507 024120                                        10$:
    508 024120  005037  002510                            CLR     REG0            ;INIT PROGRAM TIMER
    509 024124  117737  156322  002364          12$:     MOVB    @BSEL2,REDBYT   ;GET REG 17 INTO REDBYT
    510 024132  132737  000002  002364                    BITB    #MCLK,REDBYT    ;SEE IF MCLK BIT = 1 YET
    511 024140  001027                                    BNE     A1              ;BE IF MCLK = 1
    512 024142  005237  002510                            INC     REG0            ;INCREMENT TIMER
    513 024146  001366                                    BNE     12$             ;BR IF TIMER DID NOT TIME OUT YET
    514 024150  012737  000002  002404                    MOV     #MCLK,GOODAT    ;SET EXPECTED REG CONTENTS
    515 024156  013737  002364  002406                    MOV     REDBYT,BADDAT   ;SET ACTUAL REG CONTENTS
    516 024164  004737  004016                            JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
    517                                               ;REPORT MCLK BIT STUCK AT 0
    518 024170                                            ERRDF   5,EM5,ERR2
                024170  104455                                                                  TRAP    C$ERDF
                024172  000005                                                                  .WORD   5
                024174  012312                                                                  .WORD   EM5
                024176  014632                                                                  .WORD   ERR2
    519                                               ;TYPE "PLEASE INSURE M8207 RUN SWITCH (E28 SW7) IS ON"
    520 024200                                            PRINTF  #FMT24
                024200  012746  012040                                                          MOV     #FMT24,-(SP)
                024204  012746  000001                                                          MOV     #1,-(SP)
                024210  010600                                                                  MOV     SP,R0
                024212  104417                                                                  TRAP    C$PNTF
                024214  062706  000004                                                          ADD     #4,SP
    521 024220                                        A1:
    522 024220  004737  003576                            JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
    523 024224                                        ENDTST
                024224                                                                  L10036:
                024224  104401                                                                  TRAP    C$ETST
    524
    525
    526
    527
    528
    529                                               ;;*************************************************************************
    530                                               .SBTTL      TEST 14 - EXTENDED REGISTER MASTER CLEAR TEST
    531                                               ;*
    532                                               ;* FIRST, ALL READ/WRITE BITS OF EXTENDED REGS AX0-AX3 ARE SET BY LOADING
    533                                               ;* A DIFFERENT WORD OF PATTERN H INTO EACH REG. THEN, A MASTER CLEAR IS
    534                                               ;* ISSUED AND EACH REG IS READ AND COMPARED TO A WORD OF PATTERN I, WHICH
    535                                               ;* CONTAINS THE INITIALIZED STATES OF ALL THE EXTENDED REGS.
    536                                               ;*    PATTERN H = 000,000,377,017,377,377,375,377
    537                                               ;*    PATTERN I = 000,000,000,000,000,103,000,000
    538                                               ;;*************************************************************************
    539 024226                                        BGNTST
                024226                                                                  T14::
    540 024226  004737  003576                            JSR     PC,MSTCLR       ;ISSUE AN INITIAL MASTER CLEAR
    541 024232  005037  002402                            CLR     AXNUM           ;INIT AX REG BYTE NO. TO 0
```

```
    542 024236  012701  002654                  MOV     #PATH,R1        ;INIT DATA PATTERN POINTER
    543 024242  112137  002374          1$:     MOVB    (R1)+,WAX15     ;SET BITS TO LOAD INTO LO BYTE
    544 024246  112137  002376                  MOVB    (R1)+,WAX16     ;SET BITS TO LOAD INTO HI BYTE
    545 024252  004737  004312                  JSR     PC,WRITAX       ;WRITE EXTENDED REG
    546 024256  032737  000002  002420          BIT     #WRDYTO,ERROR1  ;SEE IF READY FAILED TO SET
    547 024264  001413                          BEQ     8$              ;BR IF NOT
    548 024266  012737  000014  002400          MOV     #14,REGNUM      ;SET LU REG NO = 14
    549 024274  004737  004016                  JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
    550                             ;REPORT READY NOT SET AFTER AX REG WRITE
    551 024300                                  ERRDF   52,EM52,ERR9
        024300  104455                                                                  TRAP    C$ERDF
        024302  000064                                                                  .WORD   52
        024304  014105                                                                  .WORD   EM52
        024306  020630                                                                  .WORD   ERR9
    552 024310                                  ESCAPE  TST
        024310  104410                                                                  TRAP    C$ESCAPE
        024312  000244                                                                  .WORD   L10037-.
    553 024314  062737  000002  002402  8$:     ADD     #2,AXNUM        ;INCR REG BYTE NO.
    554 024322  020127  002664                  CMP     R1,#PATI        ;SEE IF ALL REGS WRITTEN YET
    555 024326  103745                          BLO     1$              ;BR IF NOT DONE WRITING YET
    556 024330  004737  003576                  JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
    557 024334  005037  002402                  CLR     AXNUM           ;INIT EXTENDED REG BYTE NO. TO 0
    558 024340  012701  002664                  MOV     #PATI,R1        ;INIT DATA PAT POINTER FOR READS
    559 024344  004737  004124          2$:     JSR     PC,READAX       ;READ AN EXTENDED REG
    560 024350  032737  000001  002420          BIT     #RRDYTO,ERROR1  ;SEE IF READY FAILED TO SET
    561 024356  001413                          BEQ     10$             ;BR IF NOT
    562 024360  012737  000014  002400          MOV     #14,REGNUM      ;SET LU REG NO. = 14
    563 024366  004737  004016                  JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
    564                             ;REPORT READY NOT SET AFTER AX REG READ
    565 024372                                  ERRDF   53,EM53,ERR9
        024372  104455                                                                  TRAP    C$ERDF
        024374  000065                                                                  .WORD   53
        024376  014146                                                                  .WORD   EM53
        024400  020630                                                                  .WORD   ERR9
    566 024402                                  ESCAPE  TST
        024402  104410                                                                  TRAP    C$ESCAPE
        024404  000152                                                                  .WORD   L10037-.
    567 024406  023727  002402  000006  10$:     CMP     AXNUM,#6        ;SEE IF AX3-15
    568 024414  001003                          BNE     3$              ;BR IF NOT
    569 024416  142737  000372  002370          BICB    #AX315U,RAX15   ;MASK OFF UNPREDICTABLE BITS
    570 024424  123711  002370          3$:     CMPB    RAX15,(R1)      ;COMPARE LO BYTE TO EXPECTED VALUE
    571 024430  001417                          BEQ     4$              ;BR IF DATA MATCHES
    572 024432  005037  002404                  CLR     GOODAT
    573 024436  111137  002404                  MOVB    (R1),GOODAT     ;GET EXPECTED DATA BYTE
    574 024442  013737  002370  002406          MOV     RAX15,BADDAT    ;GET ACTUAL DATA BYTE
    575 024450  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
    576                             ;REPORT REG NOT INITIALIZED BY MASTER CLEAR
    577 024454                                  ERRDF   2,EM2,ERR3
        024454  104455                                                                  TRAP    C$ERDF
        024456  000002                                                                  .WORD   2
        024460  012161                                                                  .WORD   EM2
        024462  015140                                                                  .WORD   ERR3
    578 024464                                  ESCAPE  TST
        024464  104410                                                                  TRAP    C$ESCAPE
        024466  000070                                                                  .WORD   L10037-.
    579 024470  005237  002402          4$:     INC     AXNUM           ;INCREMENT AX BYTE NO.
    580 024474  005201                          INC     R1              ;INCREMENT PAT POINTER
```

```
                                        CMPB    RAX16,(R1)      ;COMPARE HI BYTE TO EXPECTED VALUE
                                        BEQ     6$              ;BR IF DATA MATCHES
                                        CLR     GOODAT
                                        MOVB    (R1),GOODAT     ;GET EXPECTED DATA BYTE
                                        MOV     RAX16,BADDAT    ;GET ACTUAL DATA BYTE
                                        JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                                ;REPORT REG NOT INITIALIZED BY MASTER CLEAR
                                        ERRDF   2,EM2,ERR3
                                                                                        TRAP    C$ERDF
                                                                                        .WORD   2
                                                                                        .WORD   EM2
                                                                                        .WORD   ERR3
                                        ESCAPE  TST
                                                                                        TRAP    C$ESCAPE
                                                                                        .WORD   L10037-.
                                6$:     INC     AXNUM           ;INCR AX BYTE NO.
                                        INC     R1              ;INCR PAT POINTER
                                        CMP     R1,#PATJ        ;SEE IF ALL REGS READ YET
                                        BLO     2$              ;BR IF NOT DONE READING YET
                                ENDTST
                                                                                L10037:
                                                                                        TRAP    C$ETST


                                ;;*******************************************************************************
                                .SBTTL      TEST 15 - EXTENDED REGISTER ADDRESSING TEST
                                ;*
                                ;* FIRST, ISSUE A MASTER CLEAR TO PUT REGS INTO INITIALIZED STATES SHOWN IN
                                ;* PATTERN I. THEN, WRITE A DIFFERENT WORD OF PATTERN J INTO EACH EXTENDED (AX)
                                ;* REG, AND AFTER EACH WRITE, READ AND COMPARE ALL EXTENDED REGS TO EXPECTED
                                ;* VALUES.
                                ;*   PATTERN I = 000,000,000,000,000,103,000,000
                                ;*   PATTERN J = 000,000,010,002,004,103,001,100
                                ;;*******************************************************************************
                                BGNTST
                                                                                T15::
                                        JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
                                        MOV     #PATI,R1        ;INIT POINTER TO PAT I
                                        MOV     #REDDAT,R2      ;INIT POINTER TO EXPECTED DATA AREA
                                3$:     MOVB    (R1)+,(R2)+     ;MOVE PAT I INTO REDDAT TABLE
                                        CMP     R1,#PATJ
                                        BLO     3$
                                        CLR     R1              ;INIT INDEX FOR WRITING
                                6$:     MOV     R1,AXNUM        ;GET AX BYTE NO. FOR WRITING
                                        MOVB    PATJ(R1),WAX15  ;SET LO AX BYTE TO BE WRITTEN
                                        MOVB    PATJ+1(R1),WAX16 ;SET HI AX BYTE TO BE WRITTEN
                                        MOVB    WAX15,REDDAT(R1) ;SET EXPECTED LO BYTE IN TABLE
                                        MOVB    WAX16,REDDAT+1(R1) ;SET EXPECTED HI BYTE IN TABLE
                                        JSR     PC,WRITAX       ;WRITE DATA BYTES INTO EXTENDED REG
                                        CLR     R3              ;INIT INDEX FOR READING
                                9$:     MOV     R3,AXNUM        ;GET AX BYTE NO. FOR READING
                                        JSR     PC,READAX       ;READ 2 AX BYTES
                                        CMP     AXNUM,#6        ;SEE IF AX3-15
                                        BNE     10$             ;BR IF NOT
```

```
TEST 15 - EXTENDED REGISTER ADDRESSING TEST

    629 024670  142737  000372  002370          BICB    #AX315U,RAX15   ;MASK OFF UNPREDICTABLE BITS
    630 024676  123763  002370  002500  10$:    CMPB    RAX15,REDDAT(R3) ;COMPARE LO BYTE READ TO EXPECTED
    631 024704  001420                          BEQ     12$             ;BR IF LO BYTE MATCHES EXPECTED
    632 024706  005037  002404                  CLR     GOODAT
    633 024712  116337  002500  002404          MOVB    REDDAT(R3),GOODAT ;GET EXPECTED LO BYTE
    634 024720  013737  002370  002406          MOV     RAX15,BADDAT    ;GET ACTUAL DATA
    635 024726  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
    636                             ;REPORT REG MISCOMPARE
    637 024732                                  ERRDF   3,EM3,ERR3
        024732  104455                                                                 TRAP    C$ERDF
        024734  000003                                                                 .WORD   3
        024736  012220                                                                 .WORD   EM3
        024740  015140                                                                 .WORD   ERR3
    638 024742                                  ESCAPE  TST
        024742  104410                                                                 TRAP    C$ESCAPE
        024744  000102                                                                 .WORD   L10040-.
    639 024746  005237  002402          12$:    INC     AXNUM           ;INCR AX BYTE NO.
    640 024752  123763  002372  002501          CMPB    RAX16,REDDAT+1(R3) ;COMPARE HI BYTE READ TO EXPECTED
    641 024760  001420                          BEQ     15$             ;BR IF HI BYTE MATCHES EXPECTED
    642 024762  005037  002404                  CLR     GOODAT
    643 024766  116337  002501  002404          MOVB    REDDAT+1(R3),GOODAT ;GET EXPECTED HI BYTE
    644 024774  013737  002372  002406          MOV     RAX16,BADDAT    ;GET ACTUAL DATA
    645 025002  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
    646                             ;REPORT REG MISCOMPARE
    647 025006                                  ERRDF   3,EM3,ERR3
        025006  104455                                                                 TRAP    C$ERDF
        025010  000003                                                                 .WORD   3
        025012  012220                                                                 .WORD   EM3
        025014  015140                                                                 .WORD   ERR3
    648 025016                                  ESCAPE  TST
        025016  104410                                                                 TRAP    C$ESCAPE
        025020  000026                                                                 .WORD   L10040-.
    649 025022  062703  000002          15$:    ADD     #2,R3           ;INCR INDEX FOR READS
    650 025026  020327  000010                  CMP     R3,#10          ;SEE IF ALL AX BYTES READ YET
    651 025032  002706                          BLT     9$              ;BR IF NOT DONE READING YET
    652 025034  062701  000002                  ADD     #2,R1           ;INCR INDEX FOR WRITES
    653 025040  020127  000010                  CMP     R1,#10          ;SEE IF ALL AX BYTES WRITTEN YET
    654 025044  002660                          BLT     6$              ;BR IF NOT DONE WRITING YET
    655 025046                      ENDTST
        025046                                                                  L10040:
        025046  104401                                                                  TRAP    C$ETST
    656
    657
    658
    659
    660
    661                             ;;*************************************************************************
    662                             .SBTTL      TEST 16 - REGS 15,16 / AX2-15,AX2-16 READ/WRITE BIT TEST
    663                             ;*
    664                             ;* USING REGS 15,16, THE INDIRECT REGS AX2-15,AX2-16 (USYRT REGS 4,5) ARE
    665                             ;* WRITTEN AND READ USING EACH WORD OF PATTERN K. AX2-15 IS COMPARED
    666                             ;* TO THE WORD WRITTEN, AND AX2-16 IS ALWAYS COMPARED TO 103. (AX2-16 IS NOT
    667                             ;* WRITEABLE).
    668                             ;*    PATTERN K =
    669                             ;*      FOR REG 15: 000,377,125,252,001,002,004,010,020,040,100,200,000,000,
    670                             ;*                  000,000,000,000,000,000,376,375,373,367,357,337,277,177,
    671                             ;*                  377,377,377,377,377,377,377,377
```

```
                                ;*      FOR REG 16: 000,377,125,252,000,000,000,000,000,000,000,000,001,002,
                                ;*                  004,010,020,040,100,200,377,377,377,377,377,377,377,377,
                                ;*                  376,375,373,367,357,337,277,177.
                                ;;*****************************************************************************
025050                          BGNTST
025050                                                                                          T16::
025050  004737  003576                  JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
025054  012701  002704                  MOV     #PATK,R1        ;INIT DATA PATTERN POINTER
025060                          3$:
025060                                  BGNSEG
025060  104404                                                                                  TRAP    C$BSEG
025062  012737  000004  002402          MOV     #4,AXNUM        ;SET BYTE NO. = 4
025070  111137  002374                  MOVB    (R1),WAX15      ;SET DATA TO WRITE INTO LO BYTE
025074  116137  000001  002376          MOVB    1(R1),WAX16     ;SET DATA TO WRITE INTO HI BYTE
025102  143737  002565  002374          BICB    ANBITS+4,WAX15  ;MASK OFF NON-READ/WRITE BITS IN LO BYTE
025110  143737  002566  002376          BICB    ANBITS+5,WAX16  ;MASK OFF NON-READ/WRITE BITS IN HI BYTE
025116  004737  004312                  JSR     PC,WRITAX       ;LOAD DATA INTO AX2-15,AX2-16
025122  004737  004124                  JSR     PC,READAX       ;READ AX2-15 AND AX2-16
025126  123737  002370  002374          CMPB    RAX15,WAX15     ;COMPARE LO BYTE DATA READ
025134  001416                          BEQ     6$              ;BR IF DATA MATCHES
025136  013737  002374  002404          MOV     WAX15,GOODAT    ;SET EXPECTED DATA
025144  013737  002370  002406          MOV     RAX15,BADDAT    ;SET ACTUAL DATA
025152  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                                ;REPORT REG MISCOMPARE
025156                                  ERRDF   3,EM3,ERR3
025156  104455                                                                                  TRAP    C$ERDF
025160  000003                                                                                  .WORD   3
025162  012220                                                                                  .WORD   EM3
025164  015140                                                                                  .WORD   ERR3
025166                                  ESCAPE  SEG
025166  104410                                                                                  TRAP    C$ESCAPE
025170  000052                                                                                  .WORD   10000$-.
025172  005237  002402          6$:     INC     AXNUM           ;SET AX BYTE NO. = 5
025176  123737  002372  002671          CMPB    RAX16,PATI+5    ;COMPARE HI BYTE DATA READ
025204  001416                          BEQ     9$              ;BR IF DATA MATCHES
025206  005037  002404                  CLR     GOODAT
025212  113737  002671  002404          MOVB    PATI+5,GOODAT   ;SET EXPECTED DATA
025220  013737  002372  002406          MOV     RAX16,BADDAT    ;SET ACTUAL DATA
025226  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                                ;REPORT REG MISCOMPARE
025232                                  ERRDF   3,EM3,ERR3
025232  104455                                                                                  TRAP    C$ERDF
025234  000003                                                                                  .WORD   3
025236  012220                                                                                  .WORD   EM3
025240  015140                                                                                  .WORD   ERR3
025242                          9$:
025242                                  ENDSEG
025242                                                                                  10000$:
025242  104405                                                                                  TRAP    C$ESEG
025244  062701  000002                  ADD     #2,R1           ;INCR PATTERN POINTER
025250  020127  003014                  CMP     R1,#PATL        ;SEE IF ALL DATA WRITTEN YET
025254  103701                          BLO     3$              ;BR IF NOT DONE YET
025256                          ENDTST
025256                                                                                  L10041:
025256  104401                                                                                  TRAP    C$ETST
```

TEST 16 - REGS 15,16 / AX2-15,AX2-16 READ/WRITE BIT TEST

```
                        ;;*************************************************************************
                        .SBTTL      TEST 17 - AX0-15,AX0-16 READ/WRITE BIT TEST
                        ;*
                        ;* IN THIS TEST, A MASTER CLEAR IS DONE, AND THEN A WRITE, READ, AND COMPARE
                        ;* ARE PERFORMED IN REGS AX0-15,AX0-16 USING EACH WORD OF PATTERN L.
                        ;* ANY BITS IN AX0-15,AX0-16 WHICH ARE NOT READ/WRITE ARE MASKED OFF (TO 0)
                        ;* IN THE EXPECTED VALUE BEFORE COMPARISON.
                        ;*    PATTERN L =
                        ;*      FOR REG 15: 000,377,000
                        ;*      FOR REG 16: 000,377,000.
                        ;;*************************************************************************
025260                  BGNTST
025260                                                                          T17::
025260  004737  003576          JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
025264  012701  003014          MOV     #PATL,R1        ;INIT DATA PATTERN POINTER
025270                  3$:
025270                          BGNSEG
025270  104404                                                                  TRAP    C$BSEG
025272  012737  000000  002402  MOV     #0,AXNUM        ;SET BYTE NO. = 0
025300  111137  002374          MOVB    (R1),WAX15      ;SET DATA TO WRITE INTO LO BYTE
025304  116137  000001  002376  MOVB    1(R1),WAX16     ;SET DATA TO WRITE INTO HI BYTE
025312  143737  002561  002374  BICB    ANBITS+0,WAX15  ;MASK OFF NON-READ/WRITE BITS IN LO BYTE
025320  143737  002562  002376  BICB    ANBITS+1,WAX16  ;MASK OFF NON-READ/WRITE BITS IN HI BYTE
025326  004737  004312          JSR     PC,WRITAX       ;LOAD DATA INTO AX0-15,AX0-16
025332  004737  004124          JSR     PC,READAX       ;READ AX0-15 AND AX0-16
025336  123737  002370  002374  CMPB    RAX15,WAX15     ;COMPARE LO BYTE DATA READ
025344  001416                  BEQ     6$              ;BR IF DATA MATCHES
025346  013737  002374  002404  MOV     WAX15,GOODAT    ;SET EXPECTED DATA
025354  013737  002370  002406  MOV     RAX15,BADDAT    ;SET ACTUAL DATA
025362  004737  004526          JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                        ;REPORT REG MISCOMPARE
025366                          ERRDF   3,EM3,ERR3
025366  104455                                                                  TRAP    C$ERDF
025370  000003                                                                  .WORD   3
025372  012220                                                                  .WORD   EM3
025374  015140                                                                  .WORD   ERR3
025376                          ESCAPE  SEG
025376  104410                                                                  TRAP    C$ESCAPE
025400  000046                                                                  .WORD   10000$-.
025402  005237  002402  6$:     INC     AXNUM           ;SET AX BYTE NO. = 1
025406  123737  002372  002376  CMPB    RAX16,WAX16     ;COMPARE HI BYTE DATA READ
025414  001414                  BEQ     9$              ;BR IF DATA MATCHES
025416  013737  002376  002404  MOV     WAX16,GOODAT    ;SET EXPECTED DATA
025424  013737  002372  002406  MOV     RAX16,BADDAT    ;SET ACTUAL DATA
025432  004737  004526          JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                        ;REPORT REG MISCOMPARE
025436                          ERRDF   3,EM3,ERR3
025436  104455                                                                  TRAP    C$ERDF
025440  000003                                                                  .WORD   3
025442  012220                                                                  .WORD   EM3
025444  015140                                                                  .WORD   ERR3
025446                  9$:
025446                          ENDSEG
025446                                                                  10000$:
```

```
TEST 17 - AX0-15,AX0-16 READ/WRITE BIT TEST

        025446  104405                                                          TRAP    C$ESEG
    757 025450  062701  000002              ADD     #2,R1           ;INCR PATTERN POINTER
    758 025454  020127  003022              CMP     R1,#PATM        ;SEE IF ALL DATA WRITTEN YET
    759 025460  103703                      BLO     3$              ;BR IF NOT DONE YET
    760 025462                      ENDTST
        025462                                                              L10042:
        025462  104401                                                          TRAP    C$ETST
    761
    762
    763
    764
    765
    766                             ;;*************************************************************************
    767                             .SBTTL      TEST 18 - AX1-15,AX1-16 READ/WRITE BIT TEST
    768                             ;*
    769                             ;* IN THIS TEST, A MASTER CLEAR IS DONE, AND THEN A WRITE, READ, AND COMPARE
    770                             ;* ARE PERFORMED IN REGS AX1-15,AX1-16 USING EACH WORD OF PATTERN K.
    771                             ;* ANY BITS IN AX1-15,AX1-16 WHICH ARE NOT READ/WRITE ARE MASKED OFF (TO 0)
    772                             ;* IN THE EXPECTED VALUE BEFORE COMPARISON.
    773                             ;;*************************************************************************
    774 025464                      BGNTST
        025464                                                                  T18::
    775 025464  004737  003576              JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
    776 025470  012701  002704              MOV     #PATK,R1        ;INIT DATA PATTERN POINTER
    777 025474                      3$:
    778 025474                              BGNSEG
        025474  104404                                                          TRAP    C$BSEG
    779 025476  012737  000002  002402      MOV     #2,AXNUM        ;SET BYTE NO. = 2
    780 025504  111137  002374              MOVB    (R1),WAX15      ;SET DATA TO WRITE INTO LO BYTE
    781 025510  116137  000001  002376      MOVB    1(R1),WAX16     ;SET DATA TO WRITE INTO HI BYTE
    782 025516  143737  002563  002374      BICB    ANBITS+2,WAX15  ;MASK OFF NON-READ/WRITE BITS IN LO BYTE
    783 025524  143737  002564  002376      BICB    ANBITS+3,WAX16  ;MASK OFF NON-READ/WRITE BITS IN HI BYTE
    784 025532  004737  004312              JSR     PC,WRITAX       ;LOAD DATA INTO AX1-15,AX1-16
    785 025536  004737  004124              JSR     PC,READAX       ;READ AX1-15 AND AX1-16
    786 025542  123737  002370  002374      CMPB    RAX15,WAX15     ;COMPARE LO BYTE DATA READ
    787 025550  001416                      BEQ     6$              ;BR IF DATA MATCHES
    788 025552  013737  002374  002404      MOV     WAX15,GOODAT    ;SET EXPECTED DATA
    789 025560  013737  002370  002406      MOV     RAX15,BADDAT    ;SET ACTUAL DATA
    790 025566  004737  004526              JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
    791                             ;REPORT REG MISCOMPARE
    792 025572                              ERRDF   3,EM3,ERR3
        025572  104455                                                          TRAP    C$ERDF
        025574  000003                                                          .WORD   3
        025576  012220                                                          .WORD   EM3
        025600  015140                                                          .WORD   ERR3
    793 025602                              ESCAPE  SEG
        025602  104410                                                          TRAP    C$ESCAPE
        025604  000046                                                          .WORD   10000$-.
    794 025606  005237  002402      6$:     INC     AXNUM           ;SET AX BYTE NO. = 3
    795 025612  123737  002372  002376      CMPB    RAX16,WAX16     ;COMPARE HI BYTE DATA READ
    796 025620  001414                      BEQ     9$              ;BR IF DATA MATCHES
    797 025622  013737  002376  002404      MOV     WAX16,GOODAT    ;SET EXPECTED DATA
    798 025630  013737  002372  002406      MOV     RAX16,BADDAT    ;SET ACTUAL DATA
    799 025636  004737  004526              JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
    800                             ;REPORT REG MISCOMPARE
    801 025642                              ERRDF   3,EM3,ERR3
        025642  104455                                                          TRAP    C$ERDF
```

```
TEST 18 - AX1-15,AX1-16 READ/WRITE BIT TEST

        025644  000003                                                                  .WORD   3
        025646  012220                                                                  .WORD   EM3
        025650  015140                                                                  .WORD   ERR3
    802 025652                          9$:
    803 025652                                  ENDSEG
        025652                                                              10000$:
        025652  104405                                                              TRAP    C$ESEG
    804 025654  062701  000002                  ADD     #2,R1           ;INCR PATTERN POINTER
    805 025660  020127  003014                  CMP     R1,#PATL        ;SEE IF ALL DATA WRITTEN YET
    806 025664  103703                          BLO     3$              ;BR IF NOT DONE YET
    807 025666                          ENDTST
        025666                                                              L10043:
        025666  104401                                                              TRAP    C$ETST
    808
    809
    810
    811
    812
    813                                 ;;*************************************************************************
    814                                 .SBTTL      TEST 19 - AX3-15,AX3-16 READ/WRITE BIT TEST
    815                                 ;*
    816                                 ;* IN THIS TEST A MASTER CLEAR IS DONE AND THEN A WRITE, READ, AND COMPARE ARE
    817                                 ;* PERFORMED IN REGS AX3-15,AX3-16 USING EACH WORD OF PATTERN V FOR WRITING,
    818                                 ;* AND PATTERN U FOR COMPARING.
    819                                 ;* ANY BITS IN AX3-15,AX3-16 WHICH ARE NOT READ/WRITE ARE MASKED OFF (TO 0)
    820                                 ;* IN THE EXPECTED VALUE BEFORE COMPARISON.
    821                                 ;*   PATTERN V =
    822                                 ;*      FOR REG 15 : 000,333,331,323,313,233,133,000,000,000,000,
    823                                 ;*                   000,000,000,000,000,000,000,000
    824                                 ;*      FOR REG 16 : 000,000,000,000,000,000,000,001,002,004,040,
    825                                 ;*                   100,200,346,345,343,307,247,147
    826                                 ;*   PATTERN U =
    827                                 ;*      FOR REG 15 : 000,001,013,011,021,101,301,000,000,000,000,
    828                                 ;*                   000,000,000,000,000,000,000,000
    829                                 ;*      FOR REG 16 : 000,000,000,000,000,000,000,001,002,004,040,
    830                                 ;*                   100,200,346,345,343,307,247,147
    831                                 ;;*************************************************************************
    832 025670                          BGNTST
        025670                                                                  T19::
    833 025670  004737  003576                  JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
    834 025674  142777  000010  154546          BICB    #LULOOP,@BSEL1  ;CLEAR LULOOP
    835 025702  012702  003152                  MOV     #PATV,R2        ;INIT PATTERN V POINTER
    836 025706  012701  003104                  MOV     #PATU,R1        ;INIT PATTERN U POINTER
    837 025712                          3$:
    838 025712                                  BGNSEG
        025712  104404                                                              TRAP    C$BSEG
    839 025714  012737  000006  002402          MOV     #6,AXNUM        ;SET BYTE NO. = 6
    840 025722  111237  002374                  MOVB    (R2),WAX15      ;SET DATA TO WRITE INTO LO BYTE
    841 025726  116237  000001  002376          MOVB    1(R2),WAX16     ;SET DATA TO WRITE INTO HI BYTE
    842 025734  004737  004312                  JSR     PC,WRITAX       ;LOAD DATA INTO AX3-15,AX3-16
    843 025740  004737  004124                  JSR     PC,READAX       ;READ AX3-15 AND AX3-16
    844 025744  132737  000001  002374          BITB    #TEST,WAX15     ;SEE IF AN INTERFACE IS SELECTED
    845 025752  001003                          BNE     4$              ;BR IF YES
    846 025754  142737  000372  002370          BICB    #AX315U,RAX15   ;MASK OFF UNPREDICTABLE BITS
    847 025762  142737  000040  002370  4$:     BICB    #C32BCC,RAX15   ;CLEAR CRC32 BCC BIT
    848 025770  123711  002370                  CMPB    RAX15,(R1)      ;COMPARE LO BYTE DATA READ
    849 025774  001417                          BEQ     6$              ;BR IF DATA MATCHES
```

TEST 19 - AX3-15,AX3-16 READ/WRITE BIT TEST

```
    850 025776  005037  002404                  CLR     GOODAT
    851 026002  111137  002404                  MOVB    (R1),GOODAT     ;SET EXPECTED DATA
    852 026006  013737  002370  002406          MOV     RAX15,BADDAT    ;SET ACTUAL DATA
    853 026014  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
    854                             ;REPORT REG MISCOMPARE
    855 026020                      ERRDF   3,EM3,ERR3
        026020  104455                                                  TRAP    C$ERDF
        026022  000003                                                  .WORD   3
        026024  012220                                                  .WORD   EM3
        026026  015140                                                  .WORD   ERR3
    856 026030                      ESCAPE  SEG
        026030  104410                                                  TRAP    C$ESCAPE
        026032  000052                                                  .WORD   10000$-.
    857 026034  005237  002402      6$:     INC     AXNUM           ;SET AX BYTE NO. = 7
    858 026040  123761  002372  000001      CMPB    RAX16,1(R1)     ;COMPARE HI BYTE DATA READ
    859 026046  001416                      BEQ     9$              ;BR IF DATA MATCHES
    860 026050  005037  002404              CLR     GOODAT
    861 026054  116137  000001  002404      MOVB    1(R1),GOODAT    ;SET EXPECTED DATA
    862 026062  013737  002372  002406      MOV     RAX16,BADDAT    ;SET ACTUAL DATA
    863 026070  004737  004526              JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
    864                             ;REPORT REG MISCOMPARE
    865 026074                      ERRDF   3,EM3,ERR3
        026074  104455                                                  TRAP    C$ERDF
        026076  000003                                                  .WORD   3
        026100  012220                                                  .WORD   EM3
        026102  015140                                                  .WORD   ERR3
    866 026104                      9$:
    867 026104                      ENDSEG
        026104                                                  10000$:
        026104  104405                                                  TRAP    C$ESEG
    868 026106  062702  000002              ADD     #2,R2           ;INCR PATTERN V POINTER
    869 026112  062701  000002              ADD     #2,R1           ;INCR PATTERN U POINTER
    870 026116  020127  003152              CMP     R1,#PATV        ;SEE IF ALL DATA WRITTEN YET
    871 026122  103673                      BLO     3$              ;BR IF NOT DONE YET
    872 026124                      ENDTST
        026124                                                  L10044:
        026124  104401                                                  TRAP    C$ETST
    873
    874
    875
    876
    877
    878                             ;;*************************************************************************
    879                             .SBTTL      TEST 20 - REG 17 - AX2-16 READ/WRITE, MASTER CLEAR TEST
    880                             ;*
    881                             ;* THIS TEST CONSISTS OF 2 SUBTESTS. IN THE FIRST SUBTEST, EACH BYTE OF PAT O
    882                             ;* IS WRITTEN INTO REG 17 AND AFTER EACH WRITE, AX2-16 IS READ AND COMPARED
    883                             ;* TO A BYTE OF PAT P.
    884                             ;*   PATTERN O = 000,041,004,010,020,040,100,101,200,201,300,111,301,375
    885                             ;*   PATTERN P = 000,113,200,040,020,010,001,104,007,105,007,144,107,157
    886                             ;* IN THE SECOND SUBTEST, REG 17 IS LOADED WITH 375, A MASTER CLEAR IS ISSUED,
    887                             ;* AND AX2-16 IS COMPARED TO ITS INITIALIZED STATE (103).
    888                             ;;*************************************************************************
    889 026126                      BGNTST
        026126                                                  120::
    890 026126  004737  003576              JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
    891 026132  012701  003050              MOV     #PAT0,R1        ;INIT PAT O POINTER
```

```
                        ;-------------------------------------------------------------------------
                        ; WRITE REG 17, READ AND COMPARE AX2-16
                        ;-------------------------------------------------------------------------
                                BGNSUB
                                                                                        T20.1:
                                                                                                TRAP    C$BSUB
                        3$:
                                BGNSEG
                                                                                                TRAP    C$BSEG
                                MOVB    (R1),WRIBYT     ;SET BYTE TO BE WRITTEN
                                JSR     PC,WRITLU       ;WRITE DATA BYTE INTO REG 17
                                JSR     PC,READAX       ;READ AX2
                                CMPB    RAX16,(R2)      ;COMPARE AX2-16 TO EXPECTED DATA
                                BEQ     6$              ;BR IF DATA MATCHES
                                CLR     LOADAT
                                MOVB    (R1),LOADAT     ;SET DATA WHICH WAS WRITTEN
                                CLR     GOODAT
                                MOVB    (R2),GOODAT     ;SET EXPECTED DATA READ
                                MOV     RAX16,BADDAT    ;SET ACTUAL DATA READ
                                JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                        ;REPORT REG MISCOMPARE
                                ERRDF   3,EM3,ERR5
                                                                                                TRAP    C$ERDF
                                                                                                .WORD   3
                                                                                                .WORD   EM3
                                                                                                .WORD   ERR5
                        6$:
                                ENDSEG
                                                                                        10000$:
                                                                                                TRAP    C$ESEG
                                INC     R1              ;INCR PAT O POINTER
                                INC     R2              ;INCR PAT P POINTER
                                CMP     R1,#PATP        ;SEE IF ALL BYTES LOADED YET
                                BLO     3$              ;BR IF NOT
                                ENDSUB
                                                                                        L10046:
                                                                                                TRAP    C$ESUB
                        ;-------------------------------------------------------------------------
                        ; LOAD REG 17, DO MASTER CLEAR, READ AND COMPARE AX2-16
                        ;-------------------------------------------------------------------------
                                BGNSUB
                                                                                        T20.2:
                                                                                                TRAP    C$BSUB
                                MOVB    #375,WRIBYT     ;SET DATA TO BE LOADED
                                JSR     PC,WRITLU       ;LOAD DATA INTO REG 17
                                JSR     PC,MSTCLR       ;PERFORM MASTER CLEAR
                                JSR     PC,READAX       ;READ AX2-15,AX2-16
                                CMPB    RAX16,PATI+5    ;SEE IF AX2-16 WAS INIT'D CORRECTLY
                                BEQ     6$              ;BR IF YES
                                CLR     GOODAT
                                MOVB    PATI+5,GOODAT   ;SET EXPECTED DATA
                                MOV     RAX16,BADDAT    ;SET ACTUAL DATA
                                JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                        ;REPORT REG NOT INITIALIZED BY MASTER CLEAR
```

```
TEST 20 - REG 17 - AX2-16 READ/WRITE, MASTER CLEAR TEST

    936 026344                          ERRDF   2,EM2,ERR3
        026344  104455                                          TRAP    C$ERDF
        026346  000002                                          .WORD   2
        026350  012161                                          .WORD   EM2
        026352  015140                                          .WORD   ERR3
    937 026354                      6$:
    938 026354                          ENDSUB
        026354                                              L10047:
        026354  104403                                          TRAP    C$ESUB
    939 026356                      ENDTST
        026356                                              L10045:
        026356  104401                                          TRAP    C$ETST
    940
    941
    942
    943
    944
    945                             ;;*****************************************************************************
    946                             .SBTTL      TEST 21 - TRANSMITTER BUFFER DATA TEST
    947                             ;* A MASTER CLEAR IS DONE FIRST, AND THEN A BYTE OF PATTERN N IS LOADED INTO
    948                             ;* REG 11 AND THE NEXT BYTE IS LOADED TWICE INTO REG 10. THE PROGRAM THEN WAITS
    949                             ;* AT LEAST 50 MICRO-SEC, AND THEN IT READS AND COMPARES AX1-15 TO THE BYTE
    950                             ;* WHICH WAS LOADED INTO REG 10, AND IT READS AND COMPARES AX1-16 TO THE BYTE
    951                             ;* WHICH WAS LOADED INTO REG 11. THIS PROCESS IS REPEATED (INCLUDING THE MASTER
    952                             ;* CLEAR) FOR EACH PAIR OF BYTES IN PATTERN N.
    953                             ;*   PATTERN N =
    954                             ;*     FOR REG 10: 000,125,252,377,000,000,000
    955                             ;*     FOR REG 11: 000,000,000,000,005,012,017
    956                             ;;*****************************************************************************
    957 026360                      BGNTST
        026360                                                                      T21::
    958 026360  012701  003032              MOV     #PATN,R1        ;INIT PATTERN POINTER
    959 026364  012737  026626  002362      MOV     #A2,RETADR      ;SET SUBROUTINE ERROR RETURN ADDRESS
    960 026372                          BGNSUB
        026372                                                                      T21.1:
        026372  104402                                                                  TRAP    C$BSUB
    961 026374  004737  003576      3$:     JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
    962 026400  004737  004662              JSR     PC,OSIRDY       ;CHECK ORDY AND OCOR FOR EXPECTED STATES
    963 026404  000001                      1
    964 026406  012737  000011  002400      MOV     #11,REGNUM      ;SET LU REG NO. = 11
    965 026414  111137  002366              MOVB    (R1),WRIBYT     ;SET DATA BYTE TO BE WRITTEN
    966 026420  004737  003750              JSR     PC,WRITLU       ;WRITE BYTE INTO REG 11
    967 026424  012737  000010  002400      MOV     #10,REGNUM      ;SET LU REG NO. = 10
    968 026432  116137  000001  002366      MOVB    1(R1),WRIBYT    ;SET DATA BYTE TO BE WRITTEN
    969 026440  004737  003750              JSR     PC,WRITLU       ;WRITE BYTE INTO REG 10
    970 026444  004737  003750              JSR     PC,WRITLU       ;WRITE IT AGAIN (SO 2 ENTRIES ARE IN SILO)
    971 026450  004737  005146              JSR     PC,WAIT50       ;WAIT FOR SILO DATA TO RIPPLE
    972 026454  004737  004662              JSR     PC,OSIRDY       ;CHECK ORDY AND OCOR FOR EXPECTED STATES
    973 026460  000003                      3
    974 026462  012737  000002  002402      MOV     #2,AXNUM        ;SET BYTE NO. FOR AX1-15
    975 026470  004737  004124              JSR     PC,READAX       ;READ AX1-15, AX1-16
    976 026474  123761  002370  000001      CMPB    RAX15,1(R1)     ;COMPARE AX1-15 TO EXPECTED
    977 026502  001420                      BEQ     6$              ;BR IF MATCH
    978 026504  005037  002404              CLR     GOODAT
    979 026510  116137  000001  002404      MOVB    1(R1),GOODAT    ;SET EXPECTED DATA
    980 026516  013737  002370  002406      MOV     RAX15,BADDAT    ;SET ACTUAL DATA
    981 026524  004737  004526              JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
```

```
                                        ;REPORT REG MISCOMPARE
                                                ERRDF   3,EM3,ERR3
026530                                                                                  TRAP    C$ERDF
026530  104455                                                                          .WORD   3
026532  000003                                                                          .WORD   EM3
026534  012220                                                                          .WORD   ERR3
026536  015140
                                                ESCAPE  SUB
026540                                                                                  TRAP    C$ESCAPE
026540  104410                                                                          .WORD   L10051-.
026542  000064
026544  005237  002402          6$:           INC     AXNUM           ;INCR AX BYTE NO.
026550  123711  002372                        CMPB    RAX16,(R1)      ;COMPARE AX1-16 TO EXPECTED
026554  001417                                BEQ     9$              ;BR IF MATCH
026556  005037  002404                        CLR     GOODAT
026562  111137  002404                        MOVB    (R1),GOODAT     ;SET EXPECTED DATA
026566  013737  002372  002406                MOV     RAX16,BADDAT    ;SET ACTUAL DATA
026574  004737  004526                        JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                                        ;REPORT REG MISCOMPARE
                                                ERRDF   3,EM3,ERR3
026600                                                                                  TRAP    C$ERDF
026600  104455                                                                          .WORD   3
026602  000003                                                                          .WORD   EM3
026604  012220                                                                          .WORD   ERR3
026606  015140
                                                ESCAPE  SUB
026610                                                                                  TRAP    C$ESCAPE
026610  104410                                                                          .WORD   L10051-.
026612  000014
026614  062701  000002          9$:           ADD     #2,R1           ;INCR DATA PATTERN POINTER
026620  020127  003050                        CMP     R1,#PATO        ;SEE IF ALL DATA BYTES WRITTEN YET
026624  103663                                BLO     3$              ;BR IF NOT DONE YET
                                        A2:
                                                ENDSUB
026626                                                                          L10051:
026626                                                                                  TRAP    C$ESUB
026626  104403
                                        ENDTST
026630                                                                          L10050:
026630                                                                                  TRAP    C$ETST
026630  104401
```

```
;;*****************************************************************************
.SBTTL      TEST 22 - TRANSMITTER BUFFER SEQUENCING TEST
;*
;* FIRST, A MASTER CLEAR IS DONE, AND THE PROGRAM CHECKS FOR ORDY=1, OCOR=0.
;* THEN, 2 TSOM CHARS ARE LOADED INTO THE TX SILO, AND ALLOWED TO RIPPLE
;* DOWN TO THE OUTPUT. THE PROGRAM CHECKS FOR ORDY=1, OCOR=1.
;* NEXT, THE PROGRAM CYCLES THE STEPLU BIT UNTIL OCOR=0 AGAIN, AND CHECKS FOR
;* THIS TO OCCUR WITHIN 3 CYCLES.
;* THE SILO IS THEN FILLED WITH 64 BYTES OF A 256-BYTE BINARY COUNT PATTERN
;* (000-377) AND THE PROGRAM CHECKS FOR ORDY=0 AFTER THE 64TH CHAR IS LOADED.
;* THE PROGRAM CYCLES STEPLU FOR 8 CYCLES AND CHECKS THAT AFTER THE 8TH, ORDY=1.
;* AX1-15 IS READ AND COMPARED TO EXPECTED DATA.
;* THE REST OF THE BINARY COUNT DATA BYTES ARE LOADED, CYCLED 8 CLOCKS, READ AND
;* COMPARED, A BYTE AT A TIME. UPON COMPLETION, THE SILO IS CHECKED TO BE EMPTY
;* WITH ORDY=1, OCOR=0.
;;*****************************************************************************
BGNTST
```

```
                026632                                                                  T22::
1023 026632  012737  027306  002362          MOV     #A3,RETADR      ;SET SUBR ERROR RETURN ADDR
1024                                    ;-------------------------------------------------------------
1025                                    ; SET MASTER CLEAR, CHECK FOR ORDY=1, OCOR=0
1026                                    ;-------------------------------------------------------------
1027 026640  004737  003576              JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
1028 026644  004737  004662              JSR     PC,OSIRDY       ;CHK ORDY=1, OCOR=0
1029 026650  000001                      1
1030                                    ;-------------------------------------------------------------
1031                                    ; LOAD 2 SOM CHARS, ALLOW SILO TO RIPPLE, CHK ORDY=1, OCOR=1
1032                                    ;-------------------------------------------------------------
1033 026652  012737  000400  002422      MOV     #TXSOM,TXWORD   ;SET DATA TO WRITE INTO SILO
1034 026660  004737  005174              JSR     PC,LDTXSI       ;LOAD THE SILO WITH SOM
1035 026664  004737  005174              JSR     PC,LDTXSI       ;LOAD ANOTHER SOM
1036 026670  004737  005146              JSR     PC,WAIT50       ;WAIT FOR DATA TO RIPPLE
1037 026674  004737  004662              JSR     PC,OSIRDY       ;CHK ORDY=1, OCOR=1
1038 026700  000003                      3
1039                                    ;-------------------------------------------------------------
1040                                    ; CLOCK LINE UNIT, CHK FOR OCOR = 0 WITHIN 3 CYCLES
1041                                    ;-------------------------------------------------------------
1042 026702  005001                      CLR     R1              ;INIT CYCLE COUNTER TO 0
1043 026704  012737  000017  002400      MOV     #17,REGNUM      ;SET REG NO. = 17
1044 026712  004737  005254          3$: JSR     PC,STPLU        ;STEP LU 1 CYCLE
1045 026716  000001                      1
1046 026720  004737  003672              JSR     PC,READLU       ;READ REG 17
1047 026724  132737  000020  002364      BITB    #OCOR,REDBYT    ;SEE IF OCOR = 0 YET
1048 026732  001404                      BEQ     6$              ;BR IF OCOR = 0
1049 026734  005201                      INC     R1              ;INCR CYCLE COUNT
1050 026736  020127  000003              CMP     R1,#3           ;SEE IF 3 CYCLES DONE YET
1051 026742  002763                      BLT     3$              ;BR IF NO
1052 026744  004737  004662          6$: JSR     PC,OSIRDY       ;CHK ORDY=1, OCOR=0
1053 026750  000001                      1
1054                                    ;-------------------------------------------------------------
1055                                    ; LOAD 64 BINARY COUNT CHARS INTO SILO, CHK ORDY=0
1056                                    ;-------------------------------------------------------------
1057 026752  005003                      CLR     R3              ;INIT PATTERN FOR WRITING
1058 026754  010337  002422          8$: MOV     R3,TXWORD       ;SET DATA TO BE WRITTEN
1059 026760  004737  005174              JSR     PC,LDTXSI       ;LOAD DATA CHAR INTO TX SILO
1060 026764  004737  005146              JSR     PC,WAIT50       ;WAIT FOR DATA TO RIPPLE IN SILO
1061 026770  020327  000077              CMP     R3,#63.         ;SEE IF 64TH CHAR JUST LOADED
1062 026774  001004                      BNE     9$              ;BR IF NO
1063 026776  012737  000002  027020      MOV     #2,14$          ;SET UP TO CHK ORDY=0,OCOR=1
1064 027004  000403                      BR      12$
1065 027006  012737  000003  027020  9$: MOV     #3,14$          ;SET UP TO CHK ORDY=1,OCOR=1
1066 027014  004737  004662         12$: JSR     PC,OSIRDY       ;CHK ORDY, OCOR
1067 027020  000000                 14$: .WORD   0
1068 027022  005203                      INC     R3              ;INCR PATTERN FOR WRITES
1069 027024  020327  000100              CMP     R3,#64.         ;SEE IF 64 CHARS LOADED YET
1070 027030  002751                      BLT     8$              ;BR IF NO
1071                                    ;-------------------------------------------------------------
1072                                    ; CLOCK LINE UNIT, CHECK ORDY = 1 WITHIN 8 CYCLES
1073                                    ;-------------------------------------------------------------
1074 027032  012737  000011  002400      MOV     #11,REGNUM      ;SET REG NO. = 11
1075 027040  005001                      CLR     R1              ;INIT CYCLE COUNT
1076 027042  004737  005254         16$: JSR     PC,STPLU        ;CLOCK LU FOR 1 CYCLE
1077 027046  000001                      1
1078 027050  004737  003672              JSR     PC,READLU       ;READ REG 11
```

```
1079 027054  132737  000020  002364          BITB    #ORDY,REDBYT    ;SEE IF ORDY = 1 YET
1080 027062  001004                          BNE     19$             ;BR IF YES
1081 027064  005201                          INC     R1              ;INCR CYCLE COUNT
1082 027066  020127  000010                  CMP     R1,#8.          ;SEE IF 8 CYCLES YET
1083 027072  002763                          BLT     16$             ;BR IF NOT YET
1084 027074  004737  004662          19$:    JSR     PC,OSIRDY       ;CHK ORDY = 1, OCOR = 1
1085 027100  000003                          3
1086                                 ;-------------------------------------------------------------------
1087                                 ; READ AND COMPARE FIRST CHARACTER IN AX1-15
1088                                 ;-------------------------------------------------------------------
1089 027102  005004                          CLR     R4              ;INIT PATTERN FOR READING
1090 027104  012737  000002  002402          MOV     #2,AXNUM        ;SET AX BYTE NO. FOR AX1-15
1091 027112  004737  004124                  JSR     PC,READAX       ;READ AX1-15
1092 027116  123704  002370                  CMPB    RAX15,R4        ;COMPARE AX1-15 TO EXPECTED
1093 027122  001415                          BEQ     20$             ;BR IF MATCH
1094 027124  010437  002404                  MOV     R4,GOODAT       ;SET EXPECTED DATA
1095 027130  013737  002370  002406          MOV     RAX15,BADDAT    ;SET ACTUAL DATA
1096 027136  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
1097                                 ;REPORT REG MISCOMPARE
1098 027142                                  ERRDF   3,EM3,ERR3
     027142  104455                                                  TRAP    C$ERDF
     027144  000003                                                  .WORD   3
     027146  012220                                                  .WORD   EM3
     027150  015140                                                  .WORD   ERR3
1099 027152                                  ESCAPE  TST
     027152  104410                                                  TRAP    C$ESCAPE
     027154  000132                                                  .WORD   L10052-.
1100 027156                          20$:
1101                                 ;-------------------------------------------------------------------
1102                                 ; LOAD AND COMPARE REST OF CHARS, MONITOR ORDY, OCOR
1103                                 ;-------------------------------------------------------------------
1104 027156  020327  000377          24$.    CMP     R3,#255.        ;SEE IF ALL CHARS LOADED YET
1105 027162  003010                          BGT     26$             ;BR IF YES
1106 027164  010337  002422                  MOV     R3,TXWORD       ;SET DATA TO BE WRITTEN
1107 027170  004737  005174                  JSR     PC,LDTXSI       ;LOAD DATA CHAR INTO TX SILO
1108 027174  005203                          INC     R3              ;INCR DATA TO BE WRITTEN
1109 027176  004737  004662                  JSR     PC,OSIRDY       ;CHK ORDY=0, OCOR=1
1110 027202  000002                          2
1111 027204  005204                  26$:    INC     R4              ;INCR PAT FOR READING
1112 027206  004737  005254                  JSR     PC,STPLU        ;CLOCK LINE UNIT FOR 8 CYCLES
1113 027212  000010                          8.
1114 027214  004737  004124                  JSR     PC,READAX       ;READ AX1-15
1115 027220  123704  002370                  CMPB    RAX15,R4        ;COMPARE AX1-15 TO EXPECTED
1116 027224  001415                          BEQ     27$             ;BR IF MATCH
1117 027226  010437  002404                  MOV     R4,GOODAT       ;SET EXPECTED DATA
1118 027232  013737  002370  002406          MOV     RAX15,BADDAT    ;SET ACTUAL DATA
1119 027240  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
1120                                 ;REPORT REG MISCOMPARE
1121 027244                                  ERRDF   3,EM3,ERR3
     027244  104455                                                  TRAP    C$ERDF
     027246  000003                                                  .WORD   3
     027250  012220                                                  .WORD   EM3
     027252  015140                                                  .WORD   ERR3
1122 027254                                  ESCAPE  TST
     027254  104410                                                  TRAP    C$ESCAPE
     027256  000030                                                  .WORD   L10052-.
1123 027260  020427  000377          27$:    CMP     R4,#255.        ;SEE IF WE READ LAST CHAR YET
```

```
1124 027264  001004                        BNE     29$             ;BR IF NOT
1125 027266  004737  004662                JSR     PC,OSIRDY       ;CHK ORDY=1, OCOR=0
1126 027272  000001                        1
1127 027274  000404                        BR      A3
1128 027276  004737  004662          29$:  JSR     PC,OSIRDY       ;CHK ORDY=1, OCOR=1
1129 027302  000003                        3
1130 027304  000724                        BR      24$             ;CONTINUE
1131 027306                         A3:
1132 027306                         ENDTST
     027306                                                                L10052:
     027306  104401                                                              TRAP    C$ETST
1133
1134
1135
1136
1137
1138                                ;;*************************************************************************
1139                                .SBTTL      TEST 23 - TX MSG TIMING TEST, CHAR MODE, WITH CRC
1140                                ;*
1141                                ;* IN THIS TEST, AN ENTIRE MESSAGE IS TRANSMITTED (USING STEPLU AND LULOOP)
1142                                ;* AND THE PROGRAM MONITORS THE OCCURRENCE OF USYRT TX BUFFER EMPTY FLAGS
1143                                ;* (BY SCANNING ORDY AND OCOR) AND OACT, AT EACH STEP. THE TEST IS DONE IN
1144                                ;* CHARACTER ORIENTED PROTOCOL MODE, USING 8-BIT CHARS AND CRC-16.
1145                                ;* THE FOLLOWING STEPS ARE DONE:
1146                                ;* A MASTER CLEAR IS DONE, AND THE LINE UNIT IS PLACED IN CHAR MODE.
1147                                ;* SOM IS SET TWICE TO SEND 2 SYNCH CHARS. THEN, 2 000 CHARS ARE SENT, AND
1148                                ;* THEN 2 TERMINATING SYNCHS ARE SENT.
1149                                ;* THE TRANSMITTER IS THEN DISABLED, USING OC, AND OACT IS MONITORED FOR THE
1150                                ;* CLEARED STATE AFTER THE 3RD SYNCH COMPLETES.
1151                                ;;*************************************************************************
1152 027310                         BGNTST
     027310                                                                T23::
1153 027310  012737  027422  002362          MOV     #A4,RETADR      ;SET TEST EXIT ADDRESS FOR ERRORS
1154 027316  004737  005540                JSR     PC,INITRN       ;DO MASTER CLR, LOAD 2 SOM'2
1155 027322  000226                        SYNCH
1156 027324  000011                        STRIP!DDCMP
1157 027326  004737  006122                JSR     PC,TXCHAR       ;LOAD A 000 CHAR, TX FIRST SYNCH (226)
1158 027332  000000                        000
1159 027334  100010                        CHPCHK!8.
1160 027336  004737  006122                JSR     PC,TXCHAR       ;LOAD 2ND 000 CHAR, TX 2ND SYNCH
1161 027342  000000                        000
1162 027344  000010                        8.
1163 027346  004737  006122                JSR     PC,TXCHAR       ;LOAD EOM CHAR, TX FIRST 000 CHAR
1164 027352  001000                        TXEOM
1165 027354  000010                        8.
1166 027356  004737  006122                JSR     PC,TXCHAR       ;LOAD EOM CHAR, TX 2ND 000 CHAR
1167 027362  001000                        TXEOM
1168 027364  000010                        8.
1169 027366  004737  006122                JSR     PC,TXCHAR       ;LOAD EOM, TX CRC-16 CHAR
1170 027372  001000                        TXEOM
1171 027374  000020                        16.
1172 027376  004737  006122                JSR     PC,TXCHAR       ;LOAD EOM, TX FIRST TERMINATING SYNCH
1173 027402  001000                        TXEOM
1174 027404  000010                        8.
1175 027406  004737  006122                JSR     PC,TXCHAR       ;LOAD EOM, TX 2ND TERMINATING SYNCH
1176 027412  001000                        TXEOM
1177 027414  000010                        8.
```

TEST 23 - TX MSG TIMING TEST, CHAR MODE, WITH CRC

```
1178 027416  004737  006274                  JSR     PC,ENDTRN       ;SET OC, MONITOR OCOR
1179 027422                          A4:
1180 027422  004737  003576                  JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR TO CLEAN UP
1181 027426                          ENDTST
     027426                                                                  L10053:
     027426  104401                                                                  TRAP    C$ETST
1182
1183
1184
1185
1186
1187                                 ;;*************************************************************************
1188                                 .SBTTL      TEST 24 - TX MSG TIMING TEST, BIT MODE, WITH CRC
1189                                 ;*
1190                                 ;* IN THIS TEST, AN ENTIRE MESSAGE IS TRANSMITTED (USING STEPLU AND LULOOP)
1191                                 ;* AND THE PROGRAM MONITORS THE OCCURRENCE OF USYRT TX BUFFER EMPTY FLAGS
1192                                 ;* (BY SCANNING ORDY AND OCOR) AND OACT, AT EACH STEP. THE TEST IS DONE IN
1193                                 ;* BIT ORIENTED PROTOCOL MODE, USING 8-BIT CHARS AND CRC-CCITT-1.
1194                                 ;* THE FOLLOWING STEPS ARE DONE:
1195                                 ;* A MASTER CLEAR IS DONE, AND THE LINE UNIT IS PLACED IN BIT MODE.
1196                                 ;* SOM IS SET TWICE TO SEND 2 FLAG CHARS. THEN, 2 000 CHARS ARE SENT, AND
1197                                 ;* THEN 2 TERMINATING FLAGS ARE SENT.
1198                                 ;* THE TRANSMITTER IS THEN DISABLED, USING OC, AND OACT IS MONITORED FOR THE
1199                                 ;* CLEARED STATE.
1200                                 ;;*************************************************************************
1201 027430                          BGNTST
     027430                                                                  T24::
1202 027430  012737  027532  002362          MOV     #A5,RETADR      ;SET TEST EXIT ADDRESS FOR ERRORS
1203 027436  004737  005540                  JSR     PC,INITRN       ;DO MASTER CLR, LOAD 2 SOM'2
1204 027442  000000                          000
1205 027444  000000                          000
1206 027446  004737  006122                  JSR     PC,TXCHAR       ;LOAD A 000 CHAR, TX FIRST FLAG
1207 027452  000000                          000
1208 027454  100010                          CHPCHK!8.
1209 027456  004737  006122                  JSR     PC,TXCHAR       ;LOAD 2ND 000 CHAR, TX 2ND FLAG
1210 027462  000000                          000
1211 027464  000010                          8.
1212 027466  004737  006122                  JSR     PC,TXCHAR       ;LOAD EOM CHAR, TX FIRST 000 CHAR
1213 027472  001000                          TXEOM
1214 027474  000010                          8.
1215 027476  004737  006122                  JSR     PC,TXCHAR       ;LOAD EOM, TX 2ND 000 CHAR AND CRC-CCITT-1 CHAR
1216 027502  001000                          TXEOM
1217 027504  000030                          24.
1218 027506  004737  006122                  JSR     PC,TXCHAR       ;LOAD EOM, TX FIRST TERMINATING FLAG
1219 027512  001000                          TXEOM
1220 027514  000010                          8.
1221 027516  004737  006122                  JSR     PC,TXCHAR       ;LOAD EOM, TX 2ND TERMINATING FLAG
1222 027522  001000                          TXEOM
1223 027524  000010                          8.
1224 027526  004737  006274                  JSR     PC,ENDTRN       ;SET OC, MONITOR OCOR
1225 027532                          A5:
1226 027532  004737  003576                  JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR TO CLEAN UP
1227 027536                          ENDTST
     027536                                                                  L10054:
     027536  104401                                                                  TRAP    C$ETST
1228
1229
```

```
                        ;;*************************************************************************
                        .SBTTL      TEST 25 - TX MSG TIMING TEST, CHAR MODE, WITH NO CRC
                        ;*
                        ;* IN THIS TEST, AN ENTIRE MESSAGE IS TRANSMITTED (USING STEPLU AND LULOOP)
                        ;* AND THE PROGRAM MONITORS THE OCCURRENCE OF USYRT TX BUFFER EMPTY FLAGS
                        ;* (BY SCANNING ORDY AND OCOR) AND OACT, AT EACH STEP. THE TEST IS DONE IN
                        ;* CHARACTER ORIENTED PROTOCOL MODE, USING 8-BIT CHARS AND NO ERROR CHECKING.
                        ;* THE FOLLOWING STEPS ARE DONE:
                        ;* A MASTER CLEAR IS DONE, AND THE LINE UNIT IS PLACED IN CHAR MODE.
                        ;* SOM IS SET TWICE TO SEND 2 SYNCH CHARS. THEN, 2 000 CHARS ARE SENT, AND
                        ;* THEN 2 TERMINATING SYNCHS ARE SENT.
                        ;* THE TEST IS PERFORMED WITH TXEN (REG14, BIT6) SET, AND THE PROGRAM CHECKS
                        ;* THAT THIS HOLDS RTS HIGH PAST THE END OF THE MESSAGE.
                        ;* THE TRANSMITTER IS THEN DISABLED, USING OC, AND OACT IS MONITORED FOR THE
                        ;* CLEARED STATE.
                        ;;*************************************************************************
027540                  BGNTST
027540                                                                          T25::
027540  012737  027726  002362          MOV     #A6,RETADR      ;SET TEST EXIT ADDRESS FOR ERRORS
027546  004737  005540                  JSR     PC,INITRN       ;DO MASTER CLR, LOAD 2 SOM'S
027552  000226                          SYNCH
027554  000311                          CRC2!CRC1!STRIP!DDCMP
027556  012737  000014  002400          MOV     #14,REGNUM      ;SET REG NO. = 14
027564  012737  000100  002366          MOV     #TXEN,WRIBYT    ;SET TXEN BIT
027572  004737  003750                  JSR     PC,WRITLU       ;LOAD TXEN BIT IN REG 14
027576  004737  006122                  JSR     PC,TXCHAR       ;LOAD A 000 CHAR, TX FIRST SYNCH (226)
027602  000000                          000
027604  100010                          CHPCHK!8.
027606  004737  006122                  JSR     PC,TXCHAR       ;LOAD 2ND 000 CHAR, TX 2ND SYNCH
027612  000000                          000
027614  000010                          8.
027616  004737  006122                  JSR     PC,TXCHAR       ;LOAD EOM CHAR, TX FIRST 000 CHAR
027622  001000                          TXEOM
027624  000010                          8.
027626  004737  006122                  JSR     PC,TXCHAR       ;LOAD EOM CHAR, TX 2ND 000 CHAR
027632  001000                          TXEOM
027634  000010                          8.
027636  004737  006122                  JSR     PC,TXCHAR       ;LOAD EOM, TX FIRST TERMINATING SYNCH
027642  001000                          TXEOM
027644  000010                          8.
027646  004737  006122                  JSR     PC,TXCHAR       ;LOAD EOM, TX 2ND TERMINATING SYNCH
027652  001000                          TXEOM
027654  000010                          8.
027656  004737  005254                  JSR     PC,STPLU        ;CLK PAST END OF MSG
027662  000030                          24.
027664  012737  000013  002400          MOV     #13,REGNUM      ;SET REG NO. = 13
027672  004737  003672                  JSR     PC,READLU       ;READ REG 13
027676  032737  000040  002364          BIT     #RTS,REDBYT     ;CHK FOR RTS STILL SET
027704  001006                          BNE     3$              ;BR IF RTS SET
027706  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                        ;REPORT RTS NOT SET
027712                                  ERRDF   60,EM60,ERR7
027712  104455                                                  TRAP    C$ERDF
027714  000074                                                  .WORD   60
```

```
TEST 25 - TX MSG TIMING TEST, CHAR MODE, WITH NO CRC

        027716  014230                                                          .WORD   EM60
        027720  017470                                                          .WORD   ERR7
  1284  027722  004737  006274          3$:     JSR     PC,ENDTRN       ;SET OC, MONITOR OCOR
  1285  027726                          A6:
  1286  027726  004737  003576                  JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR TO CLEAN UP
  1287  027732                          ENDTST
        027732                                                                  10055:
        027732  104401                                                          TRAP    C$ETST
  1288
  1289
  1290
  1291
  1292
  1293                                  ;;*************************************************************************
  1294                                  .SBTTL      TEST 26 - TX UNDERRUN SET AND CLEAR TEST - CHAR MODE
  1295                                  ;*
  1296                                  ;* IN THIS TEST, A TX UNDERRUN ERROR IS FORCED IN EACH OF 2 SITUATIONS,
  1297                                  ;* AND THEN CLEARED DIFFERENTLY IN EACH.
  1298                                  ;* IN THE FIRST, A MESSAGE IS INITIATED, A 000 CHAR IS SENT, AND THE TX
  1299                                  ;* BUFFER IS NOT SERVICED IN RESPONSE TO THE USYRT TX BUFFER EMPTY FLAG,
  1300                                  ;* WHICH CAUSES UNRR TO SET IN REG 11. THEN, SOM IS SET TO CLEAR THE ERROR,
  1301                                  ;* AND THIS IS VERIFIED.
  1302                                  ;* IN THE SECOND SITUATION, A MSG IS INITIATED, A 000 CHAR IS SENT, AND THE TX
  1303                                  ;* BUFFER IS NOT SERVICED IN RESPONSE TO THE USYRT TX BUFFER EMPTY FLAG, WHICH
  1304                                  ;* AGAIN CAUSES UNRR TO SET. THEN, A MASTER CLEAR IS DONE, AND THE UNRR BIT
  1305                                  ;* IS CHECKED TO BE CLEARED.
  1306                                  ;;*************************************************************************
  1307  027734                          BGNTST
        027734                                                                  T26::
  1308                                  ;-------------------------------------------------------------------------
  1309                                  ; CAUSE TX UNDERRUN, CHK UNRR = 1; SET SOM, CHK UNRR = 0
  1310                                  ;-------------------------------------------------------------------------
  1311  027734  012737  030272  002362          MOV     #A7,RETADR      ;SET TEST EXIT ADDRESS FOR ERRORS
  1312  027742  004737  005540                  JSR     PC,INITRN       ;DO MASTER CLEAR, LOAD 2 SOM'S
  1313  027746  000226                          SYNCH
  1314  027750  000011                          STRIP!DDCMP
  1315  027752  004737  006122                  JSR     PC,TXCHAR       ;LOAD A 000 CHAR, TX FIRST SYNCH
  1316  027756  000000                          000
  1317  027760  100010                          CHPCHK!8.
  1318  027762  004737  005254                  JSR     PC,STPLU        ;CLOCK THE TRANSMITTER UNTIL 7 BITS OF
  1319  027766  000016                          14.                     ;     THE 000 CHAR HAVE BEEN TRANSMITTED
  1320  027770  012737  000011  002400          MOV     #11,REGNUM      ;SET LU REG NO. = 11
  1321  027776  004737  003672                  JSR     PC,READLU       ;READ REG 11
  1322  030002  132737  000001  002364          BITB    #UNRR,REDBYT    ;CHK FOR UNRR = 0
  1323  030010  001410                          BEQ     6$              ;BR IF UNRR = 0
  1324  030012  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
  1325                                  ;REPORT UNRR NOT CLEARED
  1326  030016                                  ERRDF   16,EM16,ERR7
        030016  104455                                                          TRAP    C$ERDF
        030020  000020                                                          .WORD   16
        030022  012622                                                          .WORD   EM16
        030024  017470                                                          .WORD   ERR7
  1327  030026  000137  030272                  JMP     A7              ;SKIP TO END OF TEST
  1328  030032  004737  005254          6$:     JSR     PC,STPLU        ;CLOCK LAST BIT OF 000 CHAR
  1329  030036  000003                          3
  1330  030040  004737  003672                  JSR     PC,READLU       ;READ REG 11
  1331  030044  132737  000001  002364          BITB    #UNRR,REDBYT    ;CHK FOR UNRR = 1
```

TEST 26 - TX UNDERRUN SET AND CLEAR TEST - CHAR MODE

```
1332 030052  001010                        BNE     9$              ;BR IF UNRR = 1
1333 030054  004737  004526                JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
1334                              ;REPORT UNRR NOT SET
1335 030060                                ERRDF   14,EM14,ERR7
     030060  104455                                                TRAP    C$ERDF
     030062  000016                                                .WORD   14
     030064  012556                                                .WORD   EM14
     030066  017470                                                .WORD   ERR7
1336 030070  000137  030272                JMP     A7              ;SKIP TO END OF TEST
1337 030074  012737  000400  002422  9$:   MOV     #TXSOM,TXWORD   ;SET SOM CHAR TO BE WRITTEN
1338 030102  004737  005174                JSR     PC,LDTXSI       ;LOAD SOM CHAR INTO TX SILO
1339 030106  004737  005146                JSR     PC,WAIT50       ;WAIT FOR SILO DATA TO RIPPLE
1340 030112  004737  005254                JSR     PC,STPLU        ;CLOCK LU FOR 2 CYCLES
1341 030116  000002                        2
1342 030120  004737  003672                JSR     PC,READLU       ;READ REG 11
1343 030124  132737  000001  002364        BITB    #UNRR,REDBYT    ;CHK FOR UNRR = 0
1344 030132  001410                        BEQ     12$             ;BR IF UNRR = 0
1345 030134  004737  004526                JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
1346                              ;REPORT UNRR NOT CLEARED BY SOM
1347 030140                                ERRDF   13,EM13,ERR7
     030140  104455                                                TRAP    C$ERDF
     030142  000015                                                .WORD   13
     030144  012526                                                .WORD   EM13
     030146  017470                                                .WORD   ERR7
1348 030150  000137  030272                JMP     A7              ;SKIP TO END OF TEST
1349 030154                        12$:
1350                               ;-----------------------------------------------------------------
1351                               ;CAUSE TX UNDERRUN, CHK UNRR = 1; DO MASTER CLR, CHK UNRR = 0
1352                               ;-----------------------------------------------------------------
1353 030154  004737  005540                JSR     PC,INITRN       ;DO MASTER CLEAR, LOAD 2 SOM'S
1354 030160  000226                        SYNCH
1355 030162  000051                        IDLE.STRIP!DDCMP
1356 030164  004737  006122                JSR     PC,TXCHAR       ;LOAD A 000 CHAR, TX FIRST SYNCH
1357 030170  000000                        000
1358 030172  100010                        CHPCHK.8.
1359 030174  004737  005254                JSR     PC,STPLU        ;STEP THE LU UNTIL 000 HAS BEN TRANSMITTED
1360 030200  000021                        17.
1361 030202  004737  003672                JSR     PC,READLU       ;READ REG 11
1362 030206  132737  000001  002364        BITB    #UNRR,REDBYT    ;CHK FOR UNR = 1
1363 030214  001010                        BNE     16$             ;BR IF UNRR = 1
1364 030216  004737  004526                JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
1365                              ;REPORT UNRR NOT SET
1366 030222                                ERRDF   14,EM14,ERR7
     030222  104455                                                TRAP    C$ERDF
     030224  000016                                                .WORD   14
     030226  012556                                                .WORD   EM14
     030230  017470                                                .WORD   ERR7
1367 030232  000137  030272                JMP     A7              ;SKIP TO END OF TEST
1368 030236  004737  003576        16$:    JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
1369 030242  004737  003672                JSR     PC,READLU       ;READ REG 11
1370 030246  132737  000001  002364        BITB    #UNRR,REDBYT    ;CHK FOR UNRR = 0
1371 030254  001406                        BEQ     A7              ;BR IF UNRR = 0
1372 030256  004737  004526                JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
1373                              ;REPORT UNRR NOT CLEARED BY OC
1374 030262                                ERRDF   15,EM15,ERR7
     030262  104455                                                TRAP    C$ERDF
     030264  000017                                                .WORD   15
```

```
                030266  012573                                                          .WORD   EM15
                030270  017470                                                          .WORD   ERR7
          1375  030272  004737  003576          A7:     JSR     PC,MSTCLR       ;ISSUE CLEAN-UP MASTER CLEAR
          1376  030276                          ENDTST
                030276                                                          L10056:
                030276  104401                                                          TRAP    C$ETST
          1377
          1378
          1379
          1380
          1381
          1382                                  ;;*************************************************************************
          1383                                  .SBTTL      TEST 27 - TRANSMIT CHAR LENGTH TIMING TEST - CHAR MODE, CRC
          1384                                  ;*
          1385                                  ;* THE LINE UNIT IS PLACED IN CHAR MODE (DDCMP) AND A MESSAGE IS INITIATED
          1386                                  ;* WITH AN 8-BIT SYNCH AND A 5-BIT SYNCH CHAR. NEXT, A 000 CHAR IS SENT WITH
          1387                                  ;* EACH OF THE FOLLOWING TX CHAR LENGTHS : 5 BITS, 6 BITS, 7 BITS, 8 BITS.
          1388                                  ;* (FOR EXAMPLE, A 5-BIT CHAR REQUIRES 5 CLOCK CYCLES TO BE TRANSMITTED). TWO
          1389                                  ;* TERMINATING SYNCHS ARE SENT AFTER THE DATA.
          1390                                  ;;*************************************************************************
          1391  030300                          BGNTST
                030300                                                                  T27::
          1392  030300  012737  030506  002362          MOV     #AB,RETADR      ;SET TEST EXIT ADDRESS FOR ERRORS
          1393  030306  004737  005540                  JSR     PC,INITRN       ;DO MASTER CLR, LOAD 2 SOM'S
          1394  030312  000000                          000
          1395  030314  000041                          IDLE!DDCMP
          1396  030316  012737  000006  002402          MOV     #6,AXNUM        ;SET BYTE NO. = 6 FOR AX3
          1397  030324  012737  000000  002374          MOV     #000,WAX15      ;SET DATA FOR AX3-15 = 0
          1398  030332  012737  000240  002376          MOV     #TXLEN2!TXLEN0,WAX16 ;SET TX LENGTH = 5 FOR AX3-16
          1399  030340  004737  004312                  JSR     PC,WRITAX       ;LOAD AX3-15,AX3-16
          1400  030344  004737  006122                  JSR     PC,TXCHAR       ;LOAD 5-BIT 000 CHAR, TX 8-BIT SYNCH
          1401  030350  000000                          000
          1402  030352  100010                          CHPCHK!8.
          1403  030354  004737  006122                  JSR     PC,TXCHAR       ;LOAD 6-BIT 000 CHAR, TX 5-BIT SYNCH
          1404  030360  000000                          000
          1405  030362  000005                          5
          1406  030364  012737  000300  002376          MOV     #TXLEN2!TXLEN1,WAX16
          1407  030372  004737  004312                  JSR     PC,WRITAX       ;SET TX CHAR LENGTH = 6
          1408  030376  004737  006122                  JSR     PC,TXCHAR       ;LOAD 7-BIT 000 CHAR, TX 5-BIT 000 CHAR
          1409  030402  000000                          000
          1410  030404  000005                          5
          1411  030406  012737  000340  002376          MOV     #TXLEN2!TXLEN1!TXLEN0,WAX16
          1412  030414  004737  004312                  JSR     PC,WRITAX       ;SET TX CHAR LENGTH = 7
          1413  030420  004737  006122                  JSR     PC,TXCHAR       ;LOAD 8-BIT 000 CHAR, TX 6-BIT 000 CHAR
          1414  030424  000000                          000
          1415  030426  000006                          6
          1416  030430  012737  000000  002376          MOV     #000,WAX16
          1417  030436  004737  004312                  JSR     PC,WRITAX       ;SET TX CHAR LENGTH = 8
          1418  030442  004737  006122                  JSR     PC,TXCHAR       ;LOAD EOM, TX 7-BIT 000 CHAR
          1419  030446  001000                          TXEOM
          1420  030450  000007                          7
          1421  030452  004737  006122                  JSR     PC,TXCHAR       ;LOAD EOM, TX 8-BIT 000 CHAR
          1422  030456  001000                          TXEOM
          1423  030460  000010                          8.
          1424  030462  004737  006122                  JSR     PC,TXCHAR       ;LOAD EOM, TX CRC-16 CHAR
          1425  030466  001000                          TXEOM
          1426  030470  000020                          16.
```

TEST 27 - TRANSMIT CHAR LENGTH TIMING TEST - CHAR MODE, CRC

```
1427 030472  004737  006122                JSR     PC,TXCHAR       ;LOAD EOM, TX FIRST TERMINATING SYNCH
1428 030476  001000                        TXEOM
1429 030500  000010                        8.
1430 030502  004737  006274                JSR     PC,ENDTRN       ;CLEAR TRANSMITTER
1431 030506                        A8:
1432 030506                        ENDTST
     030506                                                                L10057:
     030506  104401                                                               TRAP    C$ETST
1433
1434
1435
1436
1437
1438                               ;;*************************************************************************
1439                               .SBTTL      TEST 28 - TRANSMIT CHAR LENGTH TIMING TEST - BIT MODE, CRC
1440                               ;*
1441                               ;* THE LINE UNIT IS PLACED IN BIT MODE AND A MESSAGE IS INITIATED
1442                               ;* WITH 2 FLAG CHARS. NEXT, 2 8-BIT 000 CHARS ARE SENT, FOLLOWED BY 000 CHARS
1443                               ;* WITH EACH OF THE FOLLOWING TRANSMITTER CHAR LENGTHS:
1444                               ;*    1 BIT, 2 BITS, 3 BITS, 4 BITS, 5 BITS, 6 BITS, 7 BITS, AND 8 BITS.
1445                               ;* (FOR EXAMPLE, A 5-BIT CHAR REQUIRES 5 CLOCK CYCLES TO BE TRANSMITTED).
1446                               ;* TWO TERMINATING FLAGS ARE SENT AFTER THE DATA.
1447                               ;;*************************************************************************
1448 030510                        BGNTST
     030510                                                                T28::
1449 030510  012737  031036  002362          MOV     #A9,RETADR      ;SET TEST EXIT ADDRESS FOR ERRORS
1450 030516  004737  005540                  JSR     PC,INITRN       ;DO MASTER CLR, LOAD 2 SOM'S
1451 030522  000000                          000
1452 030524  000000                          000
1453 030526  004737  006122                  JSR     PC,TXCHAR       ;LOAD FIRST 8-BIT 000 CHAR, TX FIRST FLAG
1454 030532  000000                          000
1455 030534  100010                          CHPCHK.8.
1456 030536  004737  006122                  JSR     PC,TXCHAR       ;LOAD 2ND 8-BIT 000 CHAR, TX 2ND FLAG
1457 030542  000000                          000
1458 030544  000010                          8.
1459 030546  004737  006122                  JSR     PC,TXCHAR       ;LOAD 1-BIT 000 CHAR, TX FIRST 8-BIT 000 CHAR
1460 030552  000000                          000
1461 030554  000010                          8.
1462 030556  012737  000006  002402          MOV     #6,AXNUM        ;SET BYTE NO. = 6 FOR AX3
1463 030564  012737  000000  002374          MOV     #000,WAX15      ;SET DATA FOR AX3-15 = 0
1464 030572  012737  000040  002376          MOV     #TXLEN0,WAX16   ;SET TX CHAR LENGTH = 1 FOR AX3-16
1465 030600  004737  004312                  JSR     PC,WRITAX       ;LOAD AX3-15,AX3-16
1466 030604  004737  006122                  JSR     PC,TXCHAR       ;LOAD 2-BIT 000 CHAR, TX 2ND 8-BIT 000 CHAR
1467 030610  000000                          000
1468 030612  000010                          8.
1469 030614  012737  000100  002376          MOV     #TXLEN1,WAX16
1470 030622  004737  004312                  JSR     PC,WRITAX       ;SET TX CHAR LENGTH = 2
1471 030626  004737  006122                  JSR     PC,TXCHAR       ;LOAD 3-BIT 000 CHAR, TX 1-BIT 000 CHAR
1472 030632  000000                          000
1473 030634  000001                          1
1474 030636  012737  000140  002376          MOV     #TXLEN1!TXLEN0,WAX16
1475 030644  004737  004312                  JSR     PC,WRITAX       ;SET TX CHAR LENGTH = 3
1476 030650  004737  006122                  JSR     PC,TXCHAR       ;LOAD 4-BIT 000 CHAR, TX 2-BIT 000 CHAR
1477 030654  000000                          000
1478 030656  000002                          2
1479 030660  012737  000200  002376          MOV     #TXLEN2,WAX16
1480 030666  004737  004312                  JSR     PC,WRITAX       ;SET TX CHAR LENGTH = 4
```

```
 1481 030672  004737  006122                JSR     PC,TXCHAR       ;LOAD 5-BIT 000 CHAR, TX 3-BIT 000 CHAR
 1482 030676  000000                        000
 1483 030700  000003                        3
 1484 030702  012737  000240  002376        MOV     #TXLEN2!TXLEN0,WAX16
 1485 030710  004737  004312                JSR     PC,WRITAX       ;SET TX CHAR LENGTH = 5
 1486 030714  004737  006122                JSR     PC,TXCHAR       ;LOAD 6-BIT 000 CHAR, TX 4-BIT 000 CHAR
 1487 030720  000000                        000
 1488 030722  000004                        4
 1489 030724  012737  000300  002376        MOV     #TXLEN2!TXLEN1,WAX16
 1490 030732  004737  004312                JSR     PC,WRITAX       ;SET TX CHAR LENGTH = 6
 1491 030736  004737  006122                JSR     PC,TXCHAR       ;LOAD 7-BIT 000 CHAR, TX 5-BIT 000 CHAR
 1492 030742  000000                        000
 1493 030744  000005                        5
 1494 030746  012737  000340  002376        MOV     #TXLEN2!TXLEN1!TXLEN0,WAX16
 1495 030754  004737  004312                JSR     PC,WRITAX       ;SET TX CHAR LENGTH = 7
 1496 030760  004737  006122                JSR     PC,TXCHAR       ;LOAD 8-BIT 000 CHAR, TX 6-BIT 000 CHAR
 1497 030764  000000                        000
 1498 030766  000006                        6
 1499 030770  012737  000000  002376        MOV     #000,WAX16
 1500 030776  004737  004312                JSR     PC,WRITAX       ;SET TX CHAR LENGTH = 8
 1501 031002  004737  006122                JSR     PC,TXCHAR       ;LOAD EOM, TX 7-BIT 000 CHAR
 1502 031006  001000                        TXEOM
 1503 031010  000007                        7
 1504 031012  004737  006122                JSR     PC,TXCHAR       ;LOAD EOM, TX 8-BIT 000 CHAR, CRC-CCITT-1 CHAR
 1505 031016  001000                        TXEOM
 1506 031020  000031                        25.
 1507 031022  004737  006122                JSR     PC,TXCHAR       ;LOAD EOM, TX FIRST TERMINATING FLAG
 1508 031026  001000                        TXEOM
 1509 031030  000010                        8.
 1510 031032  004737  006274                JSR     PC,ENDTRN       ;CLEAR TRANSMITTER
 1511 031036                        A9:
 1512 031036                        ENDTST
      031036                                                                L10060:
      031036  104401                                                               TRAP    C$ETST
 1513
 1514
 1515
 1516
 1517
 1518                               ;;*************************************************************************
 1519                               .SBTTL      TEST 29 - TXDATA BIT TEST - CHAR MODE, CRC
 1520                               ;*
 1521                               ;* THE LINE UNIT IS INITIALIZED AND A MSG IS INITIATED (USING STEPLU) WITH CRC-
 1522                               ;* 16 SELECTED IN CHAR MODE. TWO SYNCHS, 000,125,252,377,000, AND 2 TERMINATING
 1523                               ;* SYNCHS ARE THEN SENT. THE PROGRAM CHECKS EACH BIT OF THE TRANSMITTED
 1524                               ;* DATA CHARS, BY MONITORING TXDATA (REG 17) AS THE DATA IS CLOCKED OUT OF
 1525                               ;* THE USYRT TRANSMITTER.
 1526                               ;;*************************************************************************
 1527 031040                        BGNTST
      031040                                                                T29::
 1528 031040  004737  005540                JSR     PC,INITRN       ;DO MASTER CLR, LOAD 2 SOM'S
 1529 031044  000226                        SYNCH
 1530 031046  000011                        STRIP!DDCMP
 1531 031050  012701  003224                MOV     #MSG1+4,R1      ;GET POINTER TO DATA
 1532 031054  010103                        MOV     R1,R3
 1533 031056  012137  002422        3$:     MOV     (R1)+,TXWORD
 1534 031062  004737  005174                JSR     PC,LDTXSI       ;LOAD A DATA CHAR INTO TX SILO
```

```
 1535 031066  020127  003242                CMP     R1,#MSG1+18.    ;SEE IF ALL CHARS LOADED YET
 1536 031072  103771                        BLO     3$              ;BR IF NOT YET
 1537 031074  004737  005146                JSR     PC,WAIT50       ;WAIT FOR SILO TO RIPPLE
 1538 031100  004737  005254                JSR     PC,STPLU        ;CLOCK LU UNTIL SYNCHS ARE TX'D
 1539 031104  100020                        CHPCHK!16.
 1540 031106  011337  031116      6$:       MOV     (R3),8$         ;GET EXPECTED DATA CHAR
 1541 031112  004737  011176                JSR     PC,CKTBIT       ;CHECK TXDATA FOR CHAR BITS
 1542 031116  000000                8$:     .WORD   0               ;EXPECTED CHAR GOES HERE
 1543 031120  062703  000002                ADD     #2,R3           ;INCR PATTERN POINTER
 1544 031124  020327  003236                CMP     R3,#MSG1+14.    ;SEE IF ALL CHARS CHECKED YET
 1545 031130  103766                        BLO     6$              ;BR IF NOT YET
 1546 031132  004737  003576      16$:      JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR TO CLEAN UP
 1547 031136                     ENDTST
      031136                                                                      L^0061:
      031136  104401                                                                     TRAP    C$ETST
 1548
 1549
 1550
 1551
 1552
 1553                           ;;*************************************************************************
 1554                           .SBTTL      TEST 30 - USYRT RECEIVER MSG TEST - CHAR MODE, CRC
 1555                           ;*
 1556                           ;* THE LINE UNIT IS INITIALIZED AND A MESSAGE IS INITIATED (USING STEPLU) WITH
 1557                           ;* LULP (REG 12) SET TO LOOP THE DATA INTERNALLY IN THE USYRT, AND WITH CRC-16
 1558                           ;* SELECTED. TWO SYNCHS, 000,125,252,377,000, AND FOUR TERMINATING SYNCHS ARE
 1559                           ;* SENT. THE PROGRAM MONITORS IACT, AND THE RCV'D CHARS AND CRC BYTES ARE READ
 1560                           ;* FROM AX0-15 AND COMPARED TO EXPECTED VALUES. THE PROGRAM THEN CHECKS FOR IACT
 1561                           ;* STILL SET AFTER THE MESSAGE.
 1562                           ;;*************************************************************************
 1563 031140                   BGNTST
      031140                                                                      T30::
 1564 031140  012737  031502  002362        MOV     #24$,RETADR     ;SET TEST EXIT ADDRESS FOR ERRORS
 1565 031146  004737  003576                JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
 1566 031152  004737  010640                JSR     PC,SETUP        ;PROGRAM THE USYRT
 1567 031156  000226                        SYNCH
 1568 031160  000013                        STRIP!IERR!DDCMP
 1569 031162  000000                        000
 1570 031164  000000                        000
 1571 031166  012737  000012  002400        MOV     #12,REGNUM      ;SET LU REG NO. = 12
 1572 031174  005037  002402                CLR     AXNUM           ;SET AX BYTE NO. = 0 FOR AX0
 1573 031200  112737  000040  002366        MOVB    #LULP,WRIBYT
 1574 031206  004737  003750                JSR     PC,WRITLU       ;SET LULP IN REG 12
 1575 031212  012701  003220                MOV     #MSG1,R1        ;GET POINTER TO MSG DATA TABLE
 1576 031216  012137  002422      3$:       MOV     (R1)+,TXWORD    ;GET CHAR TO BE LOADED
 1577 031222  004737  005174                JSR     PC,LDTXSI       ;LOAD CHAR INTO TX SILO
 1578 031226  020127  003246                CMP     R1,#MSG1+22.    ;SEE IF ALL MSG CHARS LOADED YET
 1579 031232  103771                        BLO     3$              ;BR IF NOT YET
 1580 031234  004737  005146                JSR     PC,WAIT50       ;ALLOW DATA TO RIPPLE IN SILO
 1581 031240  004737  005254                JSR     PC,STPLU        ;CLOCK LU FOR 40 CYCLES (UNTIL FIRST
 1582 031244  000050                        40.                     ;   DATA CHAR IS ABOUT TO BE RECEIVED)
 1583 031246  004737  006714                JSR     PC,IACTIV       ;CHK IACT = 0
 1584 031252  000000                        0
 1585 031254  004737  005254                JSR     PC,STPLU        ;CLOCK LU UNTIL 1ST DATA CHAR IS RCV'D
 1586 031260  000006                        6
 1587 031262  012701  003224                MOV     #MSG1+4,R1
 1588 031266  004737  006714      10$:      JSR     PC,IACTIV       ;CHK IACT = 1
```

TEST 30 - USYRT RECEIVER MSG TEST - CHAR MODE, CRC

```
1589 031272  000001                        1
1590 031274  004737  004124                JSR     PC,READAX       ;READ AX0
1591 031300  023721  002370                CMP     RAX15,(R1)+     ;COMPARE RCV'D CHAR TO EXPECTED
1592 031304  001415                        BEQ     12$             ;BR IF RCV'D DATA OK
1593 031306  016137  177776  002404        MOV     -2(R1),GOODAT   ;GET EXPECTED DATA
1594 031314  013737  002370  002406        MOV     RAX15,BADDAT    ;GET ACTUAL DATA
1595 031322  004737  004526                JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
1596                              ;REPORT INCORRECT DATA CHAR RCV'D
1597 031326                                ERRDF   26,EM26,ERR3
     031326  104455                                                                TRAP    C$ERDF
     031330  000032                                                                .WORD   26
     031332  013067                                                                .WORD   EM26
     031334  015140                                                                .WORD   ERR3
1598 031336  000461                        BR      24$
1599 031340  004737  005254          12$:  JSR     PC,STPLU        ;CLOCK LU 8 CYCLES
1600 031344  000010                        8.
1601 031346  020127  003236                CMP     R1,#MSG1+14.    ;SEE IF CHECKING HI CRC BYTE YET
1602 031352  103745                        BLO     10$             ;BR IF NOT YET
1603 031354  004737  006714                JSR     PC,IACTIV       ;CHK IACT = 1
1604 031360  000001                        1
1605 031362  004737  004124                JSR     PC,READAX       ;READ AX0
1606 031366  123727  002370  000160        CMPB    RAX15,#160      ;CMP RCV'D CHAR TO EXPECTED HI CRC BYTE
1607 031374  001415                        BEQ     16$             ;BR IF HI CRC BYTE RCV'D OK
1608 031376  012737  000160  002404        MOV     #160,GOODAT     ;GET EXPECTED DATA
1609 031404  013737  002370  002406  14$:  MOV     RAX15,BADDAT    ;SET ACTUAL DATA
1610 031412  004737  004526                JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
1611                              ;REPORT INCORRECT CRC BYTE RCV'D
1612 031416                                ERRDF   27,EM27,ERR3
     031416  104455                                                                TRAP    C$ERDF
     031420  000033                                                                .WORD   27
     031422  013121                                                                .WORD   EM27
     031424  015140                                                                .WORD   ERR3
1613 031426  000425                        BR      24$
1614 031430  004737  005254          16$:  JSR     PC,STPLU        ;CLOCK LU FOR 8 CYCLES
1615 031434  000010                        8.
1616 031436  004737  006714                JSR     PC,IACTIV       ;CHK IACT = 1
1617 031442  000001                        1
1618 031444  012737  000034  002404        MOV     #034,GOODAT     ;GET EXPECTED LO CRC BYTE
1619 031452  004737  004124                JSR     PC,READAX       ;READ AX0
1620 031456  123727  002370  000034        CMPB    RAX15,#034      ;CMP RCV'D CHAR TO EXPECTED LO CRC BYTE
1621 031464  001347                        BNE     14$             ;BR IF LO CRC INCORRECT
1622 031466  004737  005254                JSR     PC,STPLU        ;CLOCK LU 8 CYCLES
1623 031472  000010                        8.
1624 031474  004737  006714                JSR     PC,IACTIV       ;CHK IACT STILL = 1
1625 031500  000001                        1
1626 031502  004737  003576          24$:  JSR     PC,MSTCLR       ;ISSUE CLEAN-UP MASTER CLEAR
1627 031506                                ENDTST
     031506                                                                L10062:
     031506  104401                                                                TRAP    C$ETST
1628
1629
1630
1631
1632
1633                              ;;*************************************************************************
1634                              .$BTTL      TEST 31 - USYRT RECEIVER MSG TEST - BIT MODE, CRC
1635                              ;*
```

```
                                        ;* THE LINE UNIT IS INITIALIZED AND A MESSAGE IS INITIATED (USING STEPLU) WITH
                                        ;* LULP (REG 12) SET TO LOOP THE DATA INTERNALLY IN THE USYRT, AND WITH CRC-
                                        ;* CCITT-1. TWO FLAGS, 000,125,252,377,000, AND TWO TERMINATING FLAGS ARE THEN
                                        ;* SENT. THE PROGRAM MONITORS IACT, RSOM, AND THE RCV'D CHARS ARE READ
                                        ;* FROM AX0-15 AND COMPARED TO EXPECTED VALUES. THE PROGRAM THEN CHECKS FOR
                                        ;* IACT = 0, SETS IC TO CLEAR THE RECEIVER, AND CHECKS FOR IACT STILL = 0.
                                        ;;*****************************************************************************
031510                                  BGNTST
031510                                                                                  T31::
031510  012737  032044  002362                 MOV     #24$,RETADR     ;SET TEST EXIT ADDRESS FOR ERRORS
031516  004737  003576                         JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
031522  004737  010640                         JSR     PC,SETUP        ;PROGRAM THE USYRT
031526  000000                                 000
031530  000002                                 IERR
031532  000000                                 000
031534  000000                                 000
031536  012737  000012  002400                 MOV     #12,REGNUM      ;SET LU REG NO. = 12
031544  005037  002402                         CLR     AXNUM           ;SET AX BYTE NO. = 0 FOR AX0
031550  112737  000040  002366                 MOVB    #LULP,WRIBYT
031556  004737  003750                         JSR     PC,WRITLU       ;SET LULP IN REG 12
031562  012701  003220                         MOV     #MSG1,R1        ;GET POINTER TO MSG DATA TABLE
031566  012137  002422          3$:            MOV     (R1)+,TXWORD    ;GET CHAR TO BE LOADED
031572  004737  005174                         JSR     PC,LDTXSI       ;LOAD CHAR INTO TX SILO
031576  020127  003242                         CMP     R1,#MSG1+18.    ;SEE IF ALL MSG CHARS LOADED YET
031602  103771                                 BLO     3$              ;BR IF NOT YET
031604  004737  005146                         JSR     PC,WAIT50       ;ALLOW DATA TO RIPPLE IN SILO
031610  004737  005254                         JSR     PC,STPLU        ;CLOCK LU FOR 50 CYCLES (UNTIL FIRST
031614  000062                                 50.                     ;   DATA CHAR IS ABOUT TO BE RECEIVED)
031616  004737  006714                         JSR     PC,IACTIV       ;CHK IACT = 0
031622  000000                                 0
031624  004737  007102                         JSR     PC,RSEOM        ;CHK RSOM = 0, REOM = 0
031630  000000                                 0
031632  004737  005254                         JSR     PC,STPLU        ;CLOCK LU UNTIL 1ST DATA CHAR IS RCV'D
031636  000006                                 6
031640  012701  003224                         MOV     #MSG1+4,R1
031644  020127  003224          5$:            CMP     R1,#MSG1+4      ;SEE IF 1ST CHAR RCV'D
031650  001007                                 BNE     6$              ;BR IF NO
031652  004737  006714                         JSR     PC,IACTIV       ;CHK IACT = 1
031656  000001                                 1
031660  004737  007102                         JSR     PC,RSEOM        ;CHK RSOM = 1, REOM = 0
031664  000001                                 1
031666  000420                                 BR      9$
031670  020127  003234          6$:            CMP     R1,#MSG1+12.    ;SEE IF LAST CHAR RCV'D
031674  001007                                 BNE     8$              ;BR IF NO
031676  004737  006714                         JSR     PC,IACTIV       ;CHK FOR IACT = 0
031702  000000                                 0
031704  004737  007102                         JSR     PC,RSEOM        ;CHK RSOM = 0, REOM = 0
031710  000000                                 0
031712  000406                                 BR      9$
031714  004737  006714          8$:            JSR     PC,IACTIV       ;CHK FOR IACT = 1
031720  000001                                 1
031722  004737  007102                         JSR     PC,RSEOM        ;CHK RSOM = 0, REOM = 0
031726  000000                                 0
031730  004737  004124          9$             JSR     PC,READAX       ;READ AX0
031734  023721  002370                         CMP     RAX15,(R1)+     ;COMPARE RCV'D CHAR TO EXPECTED
031740  001415                                 BEQ     12$             ;BR IF RCV'D DATA OK
031742  016137  177776  002404                 MOV     -2(R1),GOODAT   ;GET EXPECTED DATA
```

```
1692 031750  013737  002370  002406          MOV     RAX15,BADDAT    ;GET ACTUAL DATA
1693 031756  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
1694                                ;REPORT INCORRECT DATA CHAR RCV'D
1695 031762                                 ERRDF   26,EM26,ERR3
     031762  104455                                                                TRAP    C$ERDF
     031764  000032                                                                .WORD   26
     031766  013067                                                                .WORD   EM26
     031770  015140                                                                .WORD   ERR3
1696 031772  000424                         BR      24$
1697 031774  004737  005254          12$:    JSR     PC,STPLU        ;CLOCK LU 8 CYCLES
1698 032000  000010                         8.
1699 032002  020127  003236                 CMP     R1,#MSG1+14.    ;SEE IF ALL DATA CHARS CHECKED YET
1700 032006  103716                         BLO     5$              ;BR IF NOT YET
1701 032010  004737  006714                 JSR     PC,IACTIV       ;CHK IACT = 0
1702 032014  000000                         0
1703 032016  004737  007102                 JSR     PC,RSEOM        ;CHK RSOM = 0, REOM = 0
1704 032022  000000                         0
1705 032024  012737  000200  002366          MOV     #IC,WRIBYT
1706 032032  004737  003750                 JSR     PC,WRITLU       ;SET IC (INPUT CLEAR) IN REG 12
1707 032036  004737  006714                 JSR     PC,IACTIV       ;CHK IACT = 0
1708 032042  000000                         0
1709 032044  004737  003576          24$:    JSR     PC,MSTCLR       ;ISSUE CLEAN-UP MASTER CLEAR
1710 032050                         ENDTST
     032050                                                                    L10063:
     032050  104401                                                                TRAP    C$ETST
1711
1712
1713
1714
1715
1716                                ;;**********************************************************************
1717                                .SBTTL      TEST 32 - USYRT RECEIVER MSG TEST - CHAR MODE, NO CRC
1718                                ;*
1719                                ;* THE LINE UNIT IS INITIALIZED AND A MESSAGE IS INITIATED (USING STEPLU) WITH
1720                                ;* LULP (REG 12) SET TO LOOP THE DATA INTERNALLY IN THE USYRT, AND WITH NO
1721                                ;* ERROR DETECTION. TWO SYNCHS, 000,125,252,377,000, AND TWO SYNCHS ARE
1722                                ;* THEN SENT. THE PROGRAM MONITORS IACT, AND THE RECEIVED CHARS ARE READ FROM
1723                                ;* AX0-15 AND COMPARED TO EXPECTED VALUES. THE PROGRAM THEN CHECKS FOR IACT
1724                                ;* STILL = 0, SETS IC TO CLEAR THE RECEIVER, AND CHECKS FOR IACT = 0.
1725                                ;;**********************************************************************
1726 032052                         BGNTST
     032052                                                                    T32::
1727 032052  012737  032314  002362          MOV     #24$,RETADR     ;SET TEST EXIT ADDRESS FOR ERRORS
1728 032060  004737  003576                 JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
1729 032064  004737  010640                 JSR     PC,SETUP        ;PROGRAM THE USYRT
1730 032070  000226                         SYNCH
1731 032072  000313                         CRC2!CRC1!STRIP!IERR!DDCMP
1732 032074  000000                         000
1733 032076  000000                         000
1734 032100  012737  000012  002400          MOV     #12,REGNUM      ;SET LU REG NO. = 12
1735 032106  005037  002402                 CLR     AXNUM           ;SET AX BYTE NO. = 0 FOR AX0
1736 032112  112737  000040  002366          MOVB    #LULP,WRIBYT
1737 032120  004737  003750                 JSR     PC,WRITLU       ;SET LULP IN REG 12
1738 032124  012701  003220                 MOV     #MSG1,R1        ;GET POINTER TO MSG DATA TABLE
1739 032130  012137  002422          3$:    MOV     (R1)+,TXWORD    ;GET CHAR TO BE LOADED
1740 032134  004737  005174                 JSR     PC,LDTXSI       ;LOAD CHAR INTO TX SILO
1741 032140  020127  003242                 CMP     R1,#MSG1+18.    ;SEE IF ALL MSG CHARS LOADED YET
```

```
1742 032144  103771                          BLO     3$              ;BR IF NOT YET
1743 032146  004737  005146                  JSR     PC,WAIT50       ;ALLOW DATA TO RIPPLE IN SILO
1744 032152  004737  005254                  JSR     PC,STPLU        ;CLOCK LU FOR 24 CYCLES (UNTIL FIRST
1745 032156  000030                          24.                     ;   DATA CHAR IS ABOUT TO BE RECEIVED)
1746 032160  004737  006714                  JSR     PC,IACTIV       ;CHK IACT = 0
1747 032164  000000                          0
1748 032166  004737  005254                  JSR     PC,STPLU        ;CLOCK LU UNTIL 1ST DATA CHAR IS RCV'D
1749 032172  000006                          6
1750 032174  012701  003224                  MOV     #MSG1+4,R1
1751 032200  004737  006714          10$:    JSR     PC,IACTIV       ;CHK IACT = 1
1752 032204  000001                          1
1753 032206  004737  004124                  JSR     PC,READAX       ;READ AX0
1754 032212  023721  002370                  CMP     RAX15,(R1)+     ;COMPARE RCV'D CHAR TO EXPECTED
1755 032216  001415                          BEQ     12$             ;BR IF RCV'D DATA OK
1756 032220  016137  177776  002404          MOV     -2(R1),GOODAT   ;GET EXPECTED DATA
1757 032226  013737  002370  002406          MOV     RAX15,BADDAT    ;GET ACTUAL DATA
1758 032234  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
1759                              ;REPORT INCORRECT DATA CHAR RCV'D
1760 032240                                  ERRDF   26,EM26,ERR3
     032240  104455                                                                  TRAP    C$ERDF
     032242  000032                                                                  .WORD   26
     032244  013067                                                                  .WORD   EM26
     032246  015140                                                                  .WORD   ERR3
1761 032250  000421                          BR      24$
1762 032252  004737  005254          12$:    JSR     PC,STPLU        ;CLOCK LU 8 CYCLES
1763 032256  000010                          8.
1764 032260  020127  003236                  CMP     R1,#MSG1+14.    ;SEE IF ALL 5 DATA CHARS RCV'D YET
1765 032264  103745                          BLO     10$             ;BR IF NOT YET
1766 032266  004737  006714                  JSR     PC,IACTIV       ;CHK FOR IACT STILL = 1
1767 032272  000001                          1
1768 032274  012737  000200  002366          MOV     #IC,WRIBYT
1769 032302  004737  003750                  JSR     PC,WRITLU       ;SET IC (INPUT CLEAR) IN REG 12
1770 032306  004737  006714                  JSR     PC,IACTIV       ;CHK IACT = 0
1771 032312  000000                          0
1772 032314  004737  003576          24$:    JSR     PC,MSTCLR       ;ISSUE CLEAN-UP MASTER CLEAR
1773 032320                          ENDTST
     032320                                                                  L10064:
     032320  104401                                                                  TRAP    C$ETST
1774
1775
1776
1777
1778
1779                              ;;*************************************************************************
1780                              .SBTTL      TEST 33 - USYRT RECEIVER MSG TEST - BIT MODE, NO CRC
1781                              ;*
1782                              ;* THE LINE UNIT IS INITIALIZED AND A MESSAGE IS INITIATED (USING STEPLU) WITH
1783                              ;* LULP (REG 12) SET TO LOOP THE DATA INTERNALLY IN THE USYRT, AND WITH EPROR
1784                              ;* DETECTION INHIBITED. TWO FLAGS, 000,125,252,377,000, AND TWO TERMINATING FLAGS
1785                              ;* ARE THEN SENT. THE PROGRAM MONITORS IACT, RSOM, AND THE RCV'D CHARS ARE
1786                              ;* READ FROM AX0-15 AND COMPARED TO EXPECTED VALUES. THE PROGRAM THEN CHECKS FOR
1787                              ;* IACT = 0, SETS IC TO CLEAR THE RECEIVER, AND CHECKS FOR IACT STILL = 0.
1788                              ;;*************************************************************************
1789 032322                          BGNTST
     032322                                                                  T33::
1790 032322  012737  032656  002362          MOV     #24$,RETADR
1791 032330  004737  003576                  JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
```

TEST 33 - USYRT RECEIVER MSG TEST - BIT MODE, NO CRC

```
 1792 032334  004737  010640                    JSR     PC,SETUP        ;PROGRAM THE USYRT
 1793 032340  000000                            000
 1794 032342  000302                            CRC2!CRC1!IERR
 1795 032344  000000                            000
 1796 032346  000000                            000
 1797 032350  012737  000012  002400            MOV     #12,REGNUM      ;SET LU REG NO. = 12
 1798 032356  005037  002402                    CLR     AXNUM           ;SET AX BYTE NO. = 0 FOR AX0
 1799 032362  112737  000040  002366            MOVB    #LULP,WRIBYT
 1800 032370  004737  003750                    JSR     PC,WRITLU       ;SET LULP IN REG 12
 1801 032374  012701  003220                    MOV     #MSG1,R1        ;GET POINTER TO MSG DATA TABLE
 1802 032400  012137  002422          3$:       MOV     (R1)+,TXWORD    ;GET CHAR TO BE LOADED
 1803 032404  004737  005174                    JSR     PC,LDTXSI       ;LOAD CHAR INTO TX SILO
 1804 032410  020127  003242                    CMP     R1,#MSG1+18.    ;SEE IF ALL MSG CHARS LOADED YET
 1805 032414  103771                            BLO     3$              ;BR IF NOT YET
 1806 032416  004737  005146                    JSR     PC,WAIT50       ;ALLOW DATA TO RIPPLE IN SILO
 1807 032422  004737  005254                    JSR     PC,STPLU        ;CLOCK LU FOR 33 CYCLES (UNTIL FIRST
 1808 032426  000041                            33.                     ;   DATA CHAR IS ABOUT TO BE RECEIVED)
 1809 032430  004737  006714                    JSR     PC,IACTIV       ;CHK IACT = 0
 1810 032434  000000                            0
 1811 032436  004737  007102                    JSR     PC,RSEOM        ;CHK RSOM = 0, REOM = 0
 1812 032442  000000                            0
 1813 032444  004737  005254                    JSR     PC,STPLU        ;CLOCK LU UNTIL 1ST DATA CHAR IS RCV'D
 1814 032450  000006                            6
 1815 032452  012701  003224                    MOV     #MSG1+4,R1
 1816 032456  020127  003224          5$:       CMP     R1,#MSG1+4      ;SEE IF 1ST CHAR RCV'D
 1817 032462  001007                            BNE     6$              ;BR IF NO
 1818 032464  004737  006714                    JSR     PC,IACTIV       ;CHK IACT = 1
 1819 032470  000001                            1
 1820 032472  004737  007102                    JSR     PC,RSEOM        ;CHK RSOM = 1, REOM = 0
 1821 032476  000001                            1
 1822 032500  000420                            BR      9$
 1823 032502  020127  003234          6$:       CMP     R1,#MSG1+12.    ;SEE IF LAST CHAR RCV'D
 1824 032506  001007                            BNE     8$              ;BR IF NO
 1825 032510  004737  006714                    JSR     PC,IACTIV       ;CHK FOR IACT = 0
 1826 032514  000000                            0
 1827 032516  004737  007102                    JSR     PC,RSEOM        ;CHK RSOM = 0, REOM = 0
 1828 032522  000000                            0
 1829 032524  000406                            BR      9$
 1830 032526  004737  006714          8$:       JSR     PC,IACTIV       ;CHK FOR IACT = 1
 1831 032532  000001                            1
 1832 032534  004737  007102                    JSR     PC,RSEOM        ;CHK RSOM = 0, REOM = 0
 1833 032540  000000                            0
 1834 032542  004737  004124          9$:       JSR     PC,READAX       ;READ AX0
 1835 032546  023721  002370                    CMP     RAX15,(R1)+     ;COMPARE RCV'D CHAR TO EXPECTED
 1836 032552  001415                            BEQ     12$             ;BR IF RCV'D DATA OK
 1837 032554  016137  177776  002404            MOV     -2(R1),GOODAT   ;GET EXPECTED DATA
 1838 032562  013737  002370  002406            MOV     RAX15,BADDAT    ;GET ACTUAL DATA
 1839 032570  004737  004526                    JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
 1840                         ;REPORT INCORRECT DATA CHAR RCV'D
 1841 032574                                    ERRDF   26,EM26,ERR3
      032574  104455                                                                    TRAP    C$ERDF
      032576  000032                                                                    .WORD   26
      032600  013067                                                                    .WORD   EM26
      032602  015140                                                                    .WORD   ERR3
 1842 032604  000424                            BR      24$
 1843 032606  004737  005254          12$:      JSR     PC,STPLU        ;CLOCK LU 8 CYCLES
 1844 032612  000010                            8.
```

```
1845 032614  020127  003236                  CMP     R1,#MSG1+14.    ;SEE IF ALL DATA CHARS CHECKED YET
1846 032620  103716                          BLO     5$              ;BR IF NOT YET
1847 032622  004737  006714                  JSR     PC,IACTIV       ;CHK IACT = 0
1848 032626  000000                          0
1849 032630  004737  007102                  JSR     PC,RSEOM        ;CHK RSOM = 0, REOM = 0
1850 032634  000000                          0
1851 032636  012737  000200  002366          MOV     #IC,WRIBYT
1852 032644  004737  003750                  JSR     PC,WRITLU       ;SET IC (INPUT CLEAR) IN REG 12
1853 032650  004737  006714                  JSR     PC,IACTIV       ;CHK IACT = 0
1854 032654  000000                          0
1855 032656  004737  003576          24$:    JSR     PC,MSTCLR       ;ISSUE CLEAN-UP MASTER CLEAR
1856 032662                          ENDTST
     032662                                                                  L10065:
     032662  104401                                                                TRAP    C$ETST
1857
1858
1859
1860
1861
1862                                 ;;*************************************************************************
1863                                 .SBTTL      TEST 34 - SILO-DISABLED TRANSMITTER LOAD TEST
1864                                 ;*
1865                                 ;* THIS TEST DISABLES THE SILOS, LOADS A 125 CHARACTER INTO THE TX SILO, AND
1866                                 ;* READS AX1-15 AND CHECKS THAT THE DATA DID NOT GET LOADED INTO THE USYRT TX
1867                                 ;* BUFFER.
1868                                 ;;*************************************************************************
1869 032664                          BGNTST
     032664                                                                  T34::
1870 032664  004737  003576                  JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
1871 032670  012737  000014  002400          MOV     #14,REGNUM      ;SET REG NO. = 14
1872 032676  012737  000040  002366          MOV     #DISSI,WRIBYT   ;SET DISSI BIT
1873 032704  004737  003750                  JSR     PC,WRITLU
1874 032710  012737  000040  002426          MOV     #DISSI,DISILO   ;SET DISABLE SILO FLAG
1875 032716  012737  000125  002422          MOV     #125,TXWORD     ;LOAD 125 INTO TX SILO
1876 032724  004737  005174                  JSR     PC,LDTXSI
1877 032730  012737  000002  002402          MOV     #2,AXNUM        ;SET REG NO. FOR AX1
1878 032736  004737  004124                  JSR     PC,READAX       ;READ AX1-15, AX1-16
1879 032742  123727  002370  000000          CMPB    RAX15,#000      ;CHECK FOR AX1-15 UNCHANGED
1880 032750  001414                          BEQ     3$              ;BR IF UNCHANGED
1881 032752  012737  000000  002404          MOV     #000,GOODAT     ;GET EXPECTED DATA
1882 032760  013737  002370  002406          MOV     RAX15,BADDAT    ;GET ACTUAL DATA
1883 032766  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
1884                                 ;REPORT REG MISCOMPARE
1885 032772                                  ERRDF   3,EM3,ERR3
     032772  104455                                                                TRAP    C$ERDF
     032774  000003                                                                .WORD   3
     032776  012220                                                                .WORD   EM3
     033000  015140                                                                .WORD   EPR3
1886 033002  005037  002426          3$:     CLR     DISILO          ;CLEAR DISABLE SILO FLAG
1887 033006  004737  003576                  JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR TO CLEAN UP
1888 033012                          ENDTST
     033012                                                                  L10066:
     033012  104401                                                                TRAP    C$ETST
1889
1890
1891
1892
```

```
                        ;;*************************************************************************
                        .SBTTL      TEST 35 - SILO-DISABLED MESSAGE TEST - BIT MODE, NO CRC
                        ;*
                        ;* THE LINE UNIT IS INITIALIZED AND A MESSAGE IS INITIATED (USING STEPLU)
                        ;* WITH LULP (REG 12) SET TO LOOP THE DATA INTERNALLY IN THE USYRT, WITH SILO
                        ;* DISABLE SET, AND WITH NO ERROR DETECTION. TWO FLAGS, 000,125,252, AND
                        ;* TERMINATING FLAGS ARE THEN SENT BY LOADING THE TRANSMITTED CHARS INTO
                        ;* REG AX1. THE PROGRAM MONITORS OACT, IACT, RSOM, REOM, ORDY, OCOR, ICIR,
                        ;* IRDY, AND THE RECEIVED CHARS ARE READ FROM AX0 AND COMPARED TO EXPECTED
                        ;* VALUES.
                        ;;*************************************************************************
033014                  BGNTST
033014                                                                          T35::
033014  012737  033714  002362          MOV     #18$,RETADR     ;SET TEST EXIT ADDRESS FOR ERRORS
033022  004737  005540                  JSR     PC,INITRN       ;FIND OUT WHICH USYRT CHIP
033026  000000                          0
033030  000000                          0
033032  004737  003576                  JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
033036  004737  010640                  JSR     PC,SETUP        ;PROGRAM THE USYRT
033042  000000                          000
033044  000302                          CRC2!CRC1!IERR
033046  000000                          000
033050  000000                          000
033052  012737  000014  002400          MOV     #14,REGNUM      ;SET REG NO. = 14
033060  012737  000140  002366          MOV     #TXEN!DISSI,WRIBYT
033066  004737  003750                  JSR     PC,WRITLU       ;SET TXEN AND DISSI IN REG 14
033072  012737  000140  002426          MOV     #TXEN!DISSI,DISILO      ;SET DISABLE SILO FLAG
033100  012737  000012  002400          MOV     #12,REGNUM      ;SET LU REG NO. = 12
033106  112737  000040  002366          MOVB    #LULP,WRIBYT
033114  004737  003750                  JSR     PC,WRITLU       ;SET LULP IN REG 12
033120  012701  003220                  MOV     #MSG1,R1        ;GET POINTER TO MSG
033124  004737  004662                  JSR     PC,OSIRDY       ;CHK ORDY = 1
033130  000001                          1
033132  012737  000002  002402          MOV     #2,AXNUM        ;SET AX BYTE NO. FOR AX1
033140  112137  002374                  MOVB    (R1)+,WAX15     ;GET A CHAR
033144  112137  002376                  MOVB    (R1)+,WAX16
033150  004737  004312                  JSR     PC,WRITAX       ;LOAD CHAR INTO USYRT TX BUFFER
033154  004737  004662                  JSR     PC,OSIRDY       ;CHK ORDY = 0
033160  000000                          0
033162  004737  005352                  JSR     PC,OACTIV       ;CHK OACT = 0
033166  000000                          0
033170  004737  005254                  JSR     PC,STPLU        ;CLOCK LU FOR 3 CYCLES
033174  000003                          3
033176  004737  005352                  JSR     PC,OACTIV       ;CHK OACT = 1
033202  000001                          1
033204  012703  000004          4$:     MOV     #4,R3           ;INIT COUNTER
033210  112137  002374                  MOVB    (R1)+,WAX15     ;GET ANOTHER CHAR
033214  112137  002376                  MOVB    (R1)+,WAX16
033220  020327  000001                  CMP     R3,#1           ;SEE IF LOADING LAST DATA CHAR YET
033224  001006                          BNE     5$              ;BR IF NOT
033226  005737  002430                  TST     CHPTYP          ;SEE IF SIG USYRT
033232  001403                          BEQ     5$              ;BR IF YES
033234  112737  000002  002376          MOVB    #TEOM,WAX16     ;SET TEOM WITH LAST DATA CHAR
033242  004737  004662          5$:     JSR     PC,OSIRDY       ;CHK ORDY = 1
033246  000001                          1
033250  004737  004312                  JSR     PC,WRITAX       ;LOAD ANOTHER CHAR INTO USYRT TX BUFFER
```

```
1949 033254  004737  004662                    JSR     PC,OSIRDY       ;CHK ORDY = 0
1950 033260  000000                            0
1951 033262  004737  006714                    JSR     PC,IACTIV       ;CHK IACT = 0
1952 033266  000000                            0
1953 033270  004737  007102                    JSR     PC,RSEOM        ;CHK RSOM = 0, REOM = 0
1954 033274  000000                            0
1955 033276  004737  005254                    JSR     PC,STPLU        ;CLOCK LU FOR 8 CYCLES
1956 033302  000010                            8.
1957 033304  004737  005352                    JSR     PC,OACTIV       ;CHK OACT = 1
1958 033310  000001                            1
1959 033312  004737  004662                    JSR     PC,OSIRDY       ;CHK ORDY = 1
1960 033316  000001                            1
1961 033320  005303                            DEC     R3              ;DECR COUNTER
1962 033322  001332                            BNE     4$              ;BR IF NOT DONE YET
1963 033324  004737  006430                    JSR     PC,ISIRDY       ;CHK IRDY = 0
1964 033330  000000                            0
1965 033332  005737  002430                    TST     CHPTYP          ;SEE IF SIG USYRT
1966 033336  001007                            BNE     11$             ;BR IF NOT
1967 033340  105037  002374                    CLRB    WAX15
1968 033344  112737  000002  002376            MOVB    #TEOM,WAX16     ;LOAD EOM CHAR
1969 033352  004737  004312                    JSR     PC,WRITAX       ;LOAD ANOTHER CHAR INTO USYRT TX BUFFER
1970 033356  004737  005254          11$:      JSR     PC,STPLU        ;CLOCK LU FOR 3 CYCLES
1971 033362  000003                            3
1972 033364  004737  006430                    JSR     PC,ISIRDY       ;CHK IRDY = 1
1973 033370  000002                            2
1974 033372  004737  005352                    JSR     PC,OACTIV       ;CHK OACT = 1
1975 033376  000001                            1
1976 033400  004737  006714                    JSR     PC,IACTIV       ;CHK IACT = 1
1977 033404  000001                            1
1978 033406  004737  007102                    JSR     PC,RSEOM        ;CHK RSOM = 1, REOM = 0
1979 033412  000001                            1
1980 033414  004737  006430                    JSR     PC,ISIRDY       ;CHK IRDY = 0
1981 033420  000000                            0
1982 033422  012737  000000  002402            MOV     #0,AXNUM        ;SET AX BYTE NO. FOR AX0
1983 033430  123727  002370  000000            CMPB    RAX15,#000      ;COMPARE RCV'D CHAR TO 000
1984 033436  001415                            BEQ     9$              ;BR IF MATCH
1985 033440  012737  000000  002404            MOV     #0,GOODAT       ;SET EXPECTED DATA
1986 033446  013737  002370  002406  6$:       MOV     RAX15,BADDAT    ;SET ACTUAL DATA
1987 033454  004737  004526                    JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
1988                                  ;REPORT INCORRECT DATA CHAR RCV'D
1989 033460                                    ERRDF   26,EM26,ERR3
     033460  104455                                                                 TRAP    C$ERDF
     033462  000032                                                                 .WORD   26
     033464  013067                                                                 .WORD   EM26
     033466  015140                                                                 .WORD   ERR3
1990 033470  000511                            BR      18$
1991 033472  004737  005254          9$:       JSR     PC,STPLU        ;CLOCK LU FOR 8 CYCLES
1992 033476  000010                            8.
1993 033500  004737  006430                    JSR     PC,ISIRDY       ;CHK IRDY - 1
1994 033504  000002                            2
1995 033506  004737  005352                    JSR     PC,OACTIV       ;CHK OACT = 1
1996 033512  000001                            1
1997 033514  004737  006714                    JSR     PC,IACTIV       ;CHK IACT - 1
1998 033520  000001                            1
1999 033522  004737  007102                    JSR     PC,RSEOM        ;CHK RSOM = 0, REOM   0
2000 033526  000000                            0
2001 033530  004737  006430                    JSR     PC,ISIRDY       ;CHK IRDY - 0
```

```
2002 033534  000000                          0
2003 033536  123727  002370  000125          CMPB    RAX15,#125      ;COMPARE 2ND RCV'D CHAR TO 125
2004 033544  001404                          BEQ     12$             ;BR IF MATCH
2005 033546  012737  000125  002404          MOV     #125,GOODAT     ;SET EXPECTED DATA
2006 033554  000734                          BR      6$              ;BR TO REPORT ERROR
2007 033556  004737  005254          12$:    JSR     PC,STPLU        ;CLOCK LU FOR 8 CYCLES
2008 033562  000010                          8.
2009 033564  004737  006430                  JSR     PC,ISIRDY       ;CHK IRDY = 1
2010 033570  000002                          2
2011 033572  004737  005352                  JSR     PC,OACTIV       ;CHK OACT = 1
2012 033576  000001                          1
2013 033600  004737  006714                  JSR     PC,IACTIV       ;CHK IACT = 0
2014 033604  000000                          0
2015 033606  004737  007102                  JSR     PC,RSEOM        ;CHK RSOM = 0, REOM = 1
2016 033612  000002                          2
2017 033614  004737  006430                  JSR     PC,ISIRDY       ;CHK IRDY = 0
2018 033620  000000                          0
2019 033622  123727  002370  000252          CMPB    RAX15,#252      ;COMPARE 3RD RCV'D CHAR TO 252
2020 033630  001404                          BEQ     14$             ;BR IF MATCH
2021 033632  012737  000252  002404          MOV     #252,GOODAT     ;SET EXPECTED DATA
2022 033640  000702                          BR      6$              ;BR TO REPORT ERROR
2023 033642  012737  000014  002400  14$:    MOV     #14,REGNUM      ;SET REG NO. = 14
2024 033650  012737  000040  002366          MOV     #DISSI,WRIBYT
2025 033656  004737  003750                  JSR     PC,WRITLU       ;CLEAR TX ENABLE
2026 033662  012737  000011  002400          MOV     #11,REGNUM      ;SET REG NO. = 11
2027 033670  012737  000200  002366          MOV     #OC,WRIBYT
2028 033676  004737  003750                  JSR     PC,WRITLU       ;SET OC TO SHUT DOWN TRANSMITTER
2029 033702  004737  005146                  JSR     PC,WAIT50       ;WAIT FOR SHUTDOWN
2030 033706  004737  005352                  JSR     PC,OACTIV       ;CHK FOR OACT = 0
2031 033712  000000                          0
2032 033714  005037  002426          18$:    CLR     DISILO          ;CLEAR DISABLE SILO FLAG
2033 033720  004737  003576                  JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR TO CLEAN UP
2034 033724                          ENDTST
     033724                                                                  L10067:
     033724  104401                                                                  TRAP    C$ETST
2035
2036
2037
2038
2039
2040                                 ;;*************************************************************************
2041                                 .SBTTL      TEST 36 - RECEIVER BUFFER TEST - CHAR MODE, CRC
2042                                 ;*
2043                                 ;* FIRST, A MASTER CLEAR IS DONE AND THE PROGRAM CHECKS FOR ICIR = 1 AND IRDY
2044                                 ;* = 0. THEN, 2 SOM CHARS ARE LOADED AND CLOCKED INTO THE USYRT, AND 64
2045                                 ;* BYTES OF A 256-BYTE BINARY COUNT DATA PATTERN (000-377) ARE LOADED INTO
2046                                 ;* THE TX SILO.
2047                                 ;* THE LINE UNIT IS THEN CLOCKED UNTIL IRDY = 1, AND THE PROGRAM CHECKS FOR
2048                                 ;* THIS TO OCCUR WITHIN 40-43 CYCLES. THE PROGRAM READS THE RCV SILO, CHECKS THE
2049                                 ;* CHAR FOR 000, AND CHECKS FOR IRDY = 0 AGAIN.
2050                                 ;* THE LINE UNIT IS THEN CLOCKED IN GROUPS OF 8 CYCLES, AND AFTER EACH, THE
2051                                 ;* PROGRAM CHECKS FOR ICIR = 1, IRDY = 1, UNTIL THE 64TH GROUP, AFTER WHICH
2052                                 ;* IT CHECKS FOR ICIR = 0, IRDY = 1. THE SECOND DATA CHAR IS READ FROM THE
2053                                 ;* RECEIVER SILO AND COMPARED TO 001. THEN, THE PROGRAM CHECKS FOR ICIR = 1,
2054                                 ;* IRDY = 1 AGAIN.
2055                                 ;* THE REST OF THE BINARY COUNT DATA BYTES ARE CYCLED 8 CLOCKS AND READ AND
2056                                 ;* COMPARED A BYTE AT A TIME.
```

```
                                ;;*************************************************************************
                                BGNTST
                                                                                T36::
033726  012737  034202  002362            MOV     #A10,RETADR     ;SET TEST EXIT ADDRESS FOR ERRORS
                                ;-------------------------------------------------------------------
                                ; DO MASTER CLR, CHK FOR ICIR = 1, IRDY = 0
                                ;-------------------------------------------------------------------
033734  004737  003576                  JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
033740  004737  006430                  JSR     PC,ISIRDY       ;CHK ICIR = 1, IRDY = 0
033744  000001                          1
                                ;-------------------------------------------------------------------
                                ; LOAD AND CLOCK 2 SOM'S, LOAD 64 BYTES OF BINARY COUNT PATTERN INTO TX SILO,
                                ; CLOCK LINE UNIT, CHK FOR IRDY = 1 WITHIN 40-43 CYCLES
                                ;-------------------------------------------------------------------
033746  004737  005540                  JSR     PC,INITRN       ;LOAD 2 SOM'S, CLOCK THEM INTO USYRT
033752  000226                          SYNCH
033754  000011                          STRIP!DDCMP
033756  005003                          CLR     R3              ;INIT BINARY COUNT DATA FOR WRITING
033760  010337  002422          2$:     MOV     R3,TXWORD
033764  004737  005174                  JSR     PC,LDTXSI       ;LOAD A DATA BYTE INTO TX SILO
033770  005203                          INC     R3              ;INCR DATA
033772  020327  000100                  CMP     R3,#64.         ;SEE IF 64 BYTES LOADED YET
033776  002770                          BLT     2$              ;BR IF NOT YET
034000  004737  007434                  JSR     PC,RCV1ST       ;RECEIVE AND TIME FIRST CHARACTER
034004  000050                          40.
                                ;-------------------------------------------------------------------
                                ; READ RCV SILO, COMPARE FIRST CHAR TO 000, CHK FOR ICIR = 1, IRDY = 0
                                ;-------------------------------------------------------------------
034006  005004                  9$:     CLR     R4              ;INIT PATTERN FOR READING
034010  004737  007750                  JSR     PC,CKDATA       ;READ RCV SILO, COMPARE DATA
034014  000000                          0                       ;EXPECTED DATA = 000
034016  000000                          0                       ;DON'T CLOCK LINE UNIT
034020  005204                  16$:    INC     R4              ;INCR DATA FOR READING
034022  004737  006430                  JSR     PC,ISIRDY       ;CHK FOR ICIR = 1, IRDY = 0
034026  000001                          1
                                ;-------------------------------------------------------------------
                                ; CLOCK 63 CHARS INTO RCV SILO, CHK ICIR = 1, IRDY = 1
                                ;-------------------------------------------------------------------
034030  004737  005254          18$:    JSR     PC,STPLU        ;CLOCK LU FOR 8 CYCLES
034034  000010                          8.
034036  010337  002422                  MOV     R3,TXWORD
034042  004737  005174                  JSR     PC,LDTXSI       ;LOAD ANOTHER WORD INTO TX SILO
034046  005203                          INC     R3              ;INCR PATTERN FOR WRITING
034050  004737  006430                  JSR     PC,ISIRDY       ;CHK ICIR = 1, IRDY = 1
034054  000003                          3
034056  020327  000177                  CMP     R3,#127.        ;SEE IF 63 MORE CHARS CLOCKED YET
034062  002762                          BLT     18$             ;BR IF NOT YET
                                ;-------------------------------------------------------------------
                                ; CLOCK 1 MORE CHAR INTO RCV SILO, CHK ICIR = 0, IRDY = 1
                                ;-------------------------------------------------------------------
034064  004737  005254                  JSR     PC,STPLU        ;CLOCK LU FOR 8 CYCLES
034070  000010                          8.
034072  004737  006430                  JSR     PC,ISIRDY       ;CHK ICIR = 0, IRDY = 1
034076  000002                          2
                                ;-------------------------------------------------------------------
                                ;READ, COMPARE, CLOCK REST OF DATA CHARS
                                ;-------------------------------------------------------------------
```

```
2113 034100  010437  034110          20$:    MOV     R4,21$          ;SET EXPECTED DATA
2114 034104  004737  007750                  JSR     PC,CKDATA       ;READ AND COMPARE DATA
2115 034110  000000                  21$:    0                       ;EXPECTED SILO ENTRY GOES HERE
2116 034112  000000                          0                       ;DON'T CLOCK LINE UNIT
2117 034114  005204                  22$:    INC     R4              ;INCR DATA PATTERN FOR READS
2118 034116  020427  000400                  CMP     R4,#400         ;SEE IF ALL DONE READING YET
2119 034122  001427                          BEQ     32$             ;BR IF DONE READING
2120 034124  004737  006430                  JSR     PC,ISIRDY       ;CHK ICIR = 1, IRDY = 1
2121 034130  000003                          3
2122 034132  004737  005254                  JSR     PC,STPLU        ;CLOCK LU FOR 8 CYCLES
2123 034136  000010                          8.
2124 034140  020327  000377                  CMP     R3,#377         ;SEE IF ALL CHARS LOADED INTO TX SILO YET
2125 034144  003007                          BGT     24$             ;BR IF YES
2126 034146  010337  002422                  MOV     R3,TXWORD
2127 034152  004737  005174                  JSR     PC,LDTXSI       ;LOAD ANOTHER CHAR INTO TX SILO
2128 034156  005203                          INC     R3              ;INCR DATA PATTERN FOR WRITING
2129 034160  000137  034100                  JMP     20$
2130 034164  012737  001000  002422  24$:    MOV     #TXEOM,TXWORD
2131 034172  004737  005174                  JSR     PC,LDTXSI       ;LOAD EOM INTO TX SILO
2132 034176  000137  034100                  JMP     20$
2133 034202                          32$:
2134 034202  004737  003576          A10:    JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR TO CLEAN UP
2135 034206                          ENDTST
     034206                                                          L10070:
     034206  1044C1                                                          TRAP    C$ETST
2136
2137
2138
2139
2140
2141                                 ;;*****************************************************************************
2142                                 .SBTTL      TEST 37 - RECEIVER CHAR LENGTH TIMING TEST - CHAR MODE, NO CRC
2143                                 ;*
2144                                 ;* THE LINE UNIT IS PLACED IN CHAR MODE, WITH NO ERROR DETECTION, AND A MSG IS
2145                                 ;* INITIATED WITH 2 SYNCH CHARS. NEXT, FIFTEEN 000 CHARS ARE LOADED INTO THE
2146                                 ;* TRANSMITTER SILO. THE LINE UNIT IS THEN CLOCKED USING STEPLU WITH LULOOP
2147                                 ;* SET, WHILE THE RECEIVER CHAR LENGTH IS SET TO THE FOLLOWING VALUES : 5,6,7,8.
2148                                 ;* FOR EACH RCV CHAR LENGTH, THE PROGRAM CHECKS TO MAKE SURE THET USYRT RECEIVER
2149                                 ;* FLAGS OCCUR THE PROPER NO. OF CYCLES APART, FOR EACH RCV CHAR LENGTH.
2150                                 ;* (FOR EXAMPLE A 5-BIT CHAR TAKES 5 CLOCK CYCLES TO BE RECEIVED). A MASTER
2151                                 ;* CLEAR IS THEN DONE TO TERMINATE THE OPERATION.
2152                                 ;;*****************************************************************************
2153 034210                          BGNTST
     034210                                                          T37::
2154 034210  012737  034402  002362          MOV     #24$,RETADR     ;SET TEST EXIT ADRS FOR ERRORS
2155 034216  004737  005540                  JSR     PC,INITRN       ;DO MASTER CLR, LOAD 2 SOM'S
2156 034222  000000                          000
2157 034224  000341                          CRC2!CRC1!IDLE!DDCMP
2158 034226  012701  000017                  MOV     #15.,R1         ;INIT COUNTER
2159 034232  005037  002422                  CLR     TXWORD
2160 034236  004737  005174          3$:     JSR     PC,LDTXSI       ;LOAD A 000 CHAR INTO TX SILO
2161 034242  005301                          DEC     R1              ;DECR COUNTER
2162 034244  001374                          BNE     3$              ;BR IF NOT DONE LOADING YET
2163 034246  004737  005146                  JSR     PC,WAIT50       ;WAIT FOR SILO TO RIPPLE
2164 034252  012737  000006  002402          MOV     #6,AXNUM        ;SET BYTE NO. = 6 FOR AX3
2165 034260  012737  000000  002374          MOV     #000,WAX15      ;SET DATA FOR AX3-15 = 0
2166 034266  012737  000005  002376          MOV     #RXLEN2!RXLEN0,WAX16 ;SET RCV LEN = 5
```

```
2167 034274  004737  004312                    JSR     PC,WRITAX       ;LOAD AX3
2168 034300  004737  005254                    JSR     PC,STPLU        ;CLK LU UNTIL TX'ING 1ST DATA CHAR
2169 034304  100012                            CHPCHK!10.
2170 034306  012737  000006  002376            MOV     #RXLEN2!RXLEN1,WAX16 ;SET RCV LEN = 6
2171 034314  004737  004312                    JSR     PC,WRITAX       ;LOAD AX3
2172 034320  004737  007434                    JSR     PC,RCV1ST       ;CLOCK 5-BIT DATA CHAR
2173 034324  000005                            5
2174 034326  012737  000007  002376            MOV     #RXLEN2!RXLEN1!RXLEN0,WAX16 ;SET RCV LEN = 7
2175 034334  004737  004312                    JSR     PC,WRITAX       ;LOAD AX3
2176 034340  004737  011074                    JSR     PC,RXCHAR       ;RCV 5-BIT DATA CHAR, CLK 6-BIT
2177 034344  000006                            6
2178 034346  012737  000000  002376            MOV     #0,WAX16        ;SET RCV LEN = 8
2179 034354  004737  004312                    JSR     PC,WRITAX       ;LOAD AX3
2180 034360  004737  011074                    JSR     PC,RXCHAR       ;RCV 6-BIT DATA CHAR, CLK 7-BIT
2181 034364  000007                            7
2182 034366  004737  011074                    JSR     PC,RXCHAR       ;RCV 7-BIT DATA CHAR, CLK 8-BIT
2183 034372  000010                            8.
2184 034374  004737  011074                    JSR     PC,RXCHAR       ;RCV 8-BIT DATA CHAR
2185 034400  000010                            8.
2186 034402  004737  003576          24$:      JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR TO CLEAN UP
2187 034406                         ENDTST
     034406                                                                      L10071:
     034406  104401                                                                      TRAP    C$ETST
2188
2189
2190
2191
2192
2193                                ;;*****************************************************************************
2194                                .SBTTL      TEST 38 - RECEIVER CHAR LENGTH TIMING TEST - BIT MODE, NO CRC
2195                                ;*
2196                                ;* THE LINE UNIT IS PLACED IN BIT MODE WITH NO ERROR DETECTION, AND A MESSAGE IS
2197                                ;* INITIATED  WITH 2 FLAG CHARS. NEXT, FIFTEEN 000 CHARS ARE LOADED INTO THE
2198                                ;* TRANSMITTER SILO. THE LINE UNIT IS THEN CLOCKED USING STEPLU WITH LULOOP
2199                                ;* SET. WHILE THE RCV CHAR LENGTH IS SET TO THE FOLLOWING VALUES : 8,8,8,7,6,5,
2200                                ;* 4,3,2,1. FOR EACH RCV CHAR LENGTH, THE PROGRAM CHECKS TO MAKE SURE THAT THE
2201                                ;* USYRT RECEIVER FLAGS OCCUR THE PROPER NO. OF CYCLES APART, FOR EACH RCV
2202                                ;* CHAR LENGTH. (FOR EXAMPLE, A 5 BIT CHAR TAKES 5 CLOCK CYCLES TO BE RECEIVED).
2203                                ;* A MASTER CLEAR IS THEN DONE TO TERMINATE THE OPERATION.
2204                                ;;*****************************************************************************
2205 034410                        BGNTST
     034410                                                                      T38::
2206 034410  012737  034702  002362          MOV     #24$,RETADR     ;SET TEST EXIT ADRS FOR ERRORS
2207 034416  004737  005540                  JSR     PC,INITRN       ;DO MASTER CLR, LOAD 2 SOM'S
2208 034422  000000                          000
2209 034424  000300                          CRC2!CRC1
2210 034426  012701  000017                  MOV     #15.,R1         ;INIT COUNTER
2211 034432  005037  002422                  CLR     TXWORD
2212 034436  004737  005174          3$:     JSR     PC,LDTXSI       ;LOAD A 000 CHAR INTO TX SILO
2213 034442  005301                          DEC     R1              ;DECR COUNTER
2214 034444  001374                          BNE     3$              ;BR IF NOT DONE LOADING YET
2215 034446  004737  005146                  JSR     PC,WAIT50       ;WAIT FOR SILO TO RIPPLE
2216 034452  012737  000006  002402          MOV     #6,AXNUM        ;SET BYTE NO. = 6 FOR AX3
2217 034460  012737  000000  002374          MOV     #000,WAX15      ;SET DATA FOR AX3-15 = 0
2218 034466  004737  007434                  JSR     PC,RCV1ST       ;CLOCK FIRST 8-BIT DATA CHAR
2219 034472  000040                          32.
2220 034474  012737  000000  002376          MOV     #0,WAX16        ;SET RCV LEN = 8
```

```
2221 034502  004737  004312                    JSR     PC,WRITAX       ;LOAD AX3
2222 034506  004737  011074                    JSR     PC,RXCHAR       ;RCV FIRST 8-BIT DATA CHAR, CLK SECOND 8-BIT
2223 034512  000010                            8.
2224 034514  012737  000007  002376            MOV     #RXLEN2!RXLEN1!RXLEN0,WAX16 ;SET RCV LEN = 7
2225 034522  004737  004312                    JSR     PC,WRITAX       ;LOAD AX3
2226 034526  004737  011074                    JSR     PC,RXCHAR       ;RCV SECOND 8-BIT DATA CHAR, CLK 3RD 8-BIT
2227 034532  000010                            8.
2228 034534  012737  000006  002376            MOV     #RXLEN2!RXLEN1,WAX16    ;SET RCV LEN = 6
2229 034542  004737  004312                    JSR     PC,WRITAX       ;LOAD AX3
2230 034546  004737  011074                    JSR     PC,RXCHAR       ;RCV 3RD 8-BIT DATA CHAR, CLK 7-BIT
2231 034552  000007                            7
2232 034554  012737  000005  002376            MOV     #RXLEN2!RXLEN0,WAX16    ;SET RCV LEN = 5
2233 034562  004737  004312                    JSR     PC,WRITAX       ;LOAD AX3
2234 034566  004737  011074                    JSR     PC,RXCHAR       ;RCV 7-BIT DATA CHAR, CLK 6-BIT
2235 034572  000006                            6
2236 034574  012737  000004  002376            MOV     #RXLEN2,WAX16   ;SET RCV LEN = 4
2237 034602  004737  004312                    JSR     PC,WRITAX       ;LOAD AX3
2238 034606  004737  011074                    JSR     PC,RXCHAR       ;RCV 6-BIT DATA CHAR, CLK 5-BIT
2239 034612  000005                            5
2240 034614  012737  000003  002376            MOV     #RXLEN1!RXLEN0,WAX16    ;SET RCV LEN = 3
2241 034622  004737  004312                    JSR     PC,WRITAX       ;LOAD AX3
2242 034626  004737  011074                    JSR     PC,RXCHAR       ;RCV 5-BIT DATA CHAR, CLR 4-BIT
2243 034632  000004                            4
2244 034634  012737  000002  002376            MOV     #RXLEN1,WAX16   ;SET RCV LEN = 2
2245 034642  004737  004312                    JSR     PC,WRITAX       ;LOAD AX3
2246 034646  004737  011074                    JSR     PC,RXCHAR       ;RCV 4-BIT DATA CHAR, CLK 3-BIT
2247 034652  000003                            3
2248 034654  012737  000001  002376            MOV     #RXLEN0,WAX16   ;SET RCV LEN = 1
2249 034662  004737  004312                    JSR     PC,WRITAX       ;LOAD AX3
2250 034666  004737  011074                    JSR     PC,RXCHAR       ;RCV 3-BIT DATA CHAR, CLK 2-BIT
2251 034672  000002                            2
2252 034674  004737  011074                    JSR     PC,RXCHAR       ;RCV 2-BIT DATA CHAR, CLK 1-BIT
2253 034700  000001                            1
2254 034702  004737  003576          24$:      JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR TO CLEAN UP
2255 034706                         ENDTST
     034706                                                                    L10072:
     034706  104401                                                                TRAP    C$ETST
2256
2257
2258
2259
2260
2261                                ;;*************************************************************************
2262                                .SBTTL      TEST 39 - TRANSMITTER UNDERRUN ERROR, IDLE MARKING, CHAR MODE,NO CRC
2263                                ;*
2264                                ;* THE LINE UNIT IS PLACED IN CHAR MODE, AND THE IDLE BIT IS SET. THEN, A
2265                                ;* MSG IS INITIATED, A 000 CHAR IS SENT, AND THE TX BUFFER IS NOT SERVICED
2266                                ;* IN RESPONSE TO THE USYRT TX BUFFER EMPTY FLAG, WHICH CAUSES A TX UNDERRUN
2267                                ;* ERROR. THEN, THE RECEIVER IS CLOCKED AND CHECKED FOR TWO 377 CHARS TO BE
2268                                ;* RECEIVED (LINE MARKING) BEFORE SHUTTING DOWN WITH A MASTER CLEAR.
2269                                ;;*************************************************************************
2270 034710                         BGNTST
     034710                                                                    T39::
2271 034710  012737  034772  002362          MOV     #24$,RETADR     ;SET TEST EXIT ADDRESS FOR ERRORS
2272 034716  004737  005540                  JSR     PC,INITRN       ;MST CLR, LOAD 2 SOM'S
2273 034722  000226                          SYNCH
2274 034724  000341                          CRC2!CRC1!IDLE!DDCMP
```

```
2275 034726  012737  000000  002422          MOV     #000,TXWORD
2276 034734  004737  005174                  JSR     PC,LDTXSI       ;LOAD 000 CHAR INTO TX SILO
2277 034740  004737  005254                  JSR     PC,STPLU        ;CLOCK LINE UNIT UNTIL LINE GOES MARKING
2278 034744  000063                          51.
2279 034746  004737  007354                  JSR     PC,RDRXSI       ;READ 000 CHAR
2280 034752  004737  007750                  JSR     PC,CKDATA       ;READ AND CHECK FOR MARK CHAR (377)
2281 034756  000377                          377
2282 034760  000000                          000
2283 034762  004737  007750                  JSR     PC,CKDATA       ;READ AND CHECK FOR ANOTHER MARK CHAR
2284 034766  000377                          377
2285 034770  000000                          000
2286 034772  004737  003576          24$:    JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR TO CLEAN UP
2287 034776                          ENDTST
     034776                                                                  L10073:
     034776  104401                                                                  TRAP    C$ETST
2288
2289
2290
2291
2292
2293                                 ;;*************************************************************************
2294                                 .SBTTL      TEST 40 - MSG TERMINATION WITH GA CHARS - BIT MODE,NO CRC
2295                                 ;*
2296                                 ;* THE DEVICE IS ENABLED FOR TRANSMIT AND RECEIVE, AND A MESSAGE IS
2297                                 ;* INITIATED IN BIT MODE.
2298                                 ;* 2 FLAG CHARACTERS ARE SENT, FOLLOWED BY
2299                                 ;* THE FOLLOWING DATA CHARACTERS : 000, 125, 252, 377, 000. THEN THE LOOP
2300                                 ;* MODE BIT (STRIP) IS SET AND 2 TERMINATING GO-AHEAD CHARACTERS ARE
2301                                 ;* SENT. EACH USYRT RCV FLAG IS TIMED AS IT IS RECEIVED, AND THE 5 DATA
2302                                 ;* WORDS ARE READ AND COMPARED TO EXPECTED VALUES.
2303                                 ;* ALSO, THE FIRST GA CHAR IS CHECKED BY SCANNING THE TXDATA BIT AS THE GA
2304                                 ;* IS BEING TRANSMITTED (GA = 376 OCTAL).
2305                                 ;* THE TEST ALSO CHECKS FOR SETTING OF RAB AND EBLK
2306                                 ;* IN LOOP MODE.
2307                                 ;*************************************************************************
2308 035000                          BGNTST
     035000                                                                  T40::
2309 035000  012737  035134  002362          MOV     #24$,RETADR     ;SET TEST EXIT ADRS FOR ERRORS
2310 035006  004737  005540                  JSR     PC,INITRN       ;MST CLR, LOAD 2 SOM'S
2311 035012  000000                          000
2312 035014  000310                          CRC2!CRC1!STRIP
2313 035016  004737  011016                  JSR     PC,LODMSG       ;LOAD DATA CHARS INTO TX SILO
2314 035022  003224                          MSG1+4
2315 035024  000005                          5
2316 035026  012737  005000  002422          MOV     #TXGOA!TXEOM,TXWORD
2317 035034  004737  005174                  JSR     PC,LDTXSI       ;LOAD A GA CHAR INTO TX SILO
2318 035040  004737  005174                  JSR     PC,LDTXSI       ;LOAD ANOTHER GA
2319 035044  004737  005146                  JSR     PC,WAIT50       ;ALLOW SILO TO RIPPLE
2320 035050  004737  005254                  JSR     PC,STPLU        ;CLOCK LU UNTIL GA CHAR IS TX'ING
2321 035054  100071                          CHPCHK!57.
2322 035056  004737  011176                  JSR     PC,CKTBIT       ;SCAN TXDATA BIT FOR GA CHAR
2323 035062  000376                          376
2324 035064  004737  007750                  JSR     PC,CKDATA       ;RCV 000 CHAR, CLK 125
2325 035070  000000                          000
2326 035072  000000                          0
2327 035074  004737  007750                  JSR     PC,CKDATA       ;RCV 125 CHAR, CLK 252
2328 035100  000125                          125
```

```
2329 035102  000000                          0
2330 035104  004737  007750                  JSR     PC,CKDATA       ;RCV 252 CHAR, CLK 377
2331 035110  000252                          252
2332 035112  000000                          0
2333 035114  004737  007750                  JSR     PC,CKDATA       ;RCV 377 CHAR
2334 035120  000377                          377
2335 035122  000010                          8.
2336 035124  004737  007750                  JSR     PC,CKDATA       ;RCV 000 CHAR, CHK RAB = 1, EBLK = 1
2337 035130  003000                          3000
2338 035132  000010                          8.
2339 035134  004737  003576          24$:    JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
2340 035140                          ENDTST
     035140                                                                  L10074:
     035140  104401                                                                  TRAP    C$ETST
2341
2342
2343
2344
2345
2346                                 ;;*************************************************************************
2347                                 .SBTTL      TEST 41 - IDLE SYNCHS TEST - CHAR MODE
2348                                 ;*
2349                                 ;* THE DEVICE IS ENABLED FOR TRANSMIT AND RECEIVE, AND A MESSAGE IS
2350                                 ;* INITIATED IN CHAR MODE. 24(DEC) SYNCHS ARE SENT.
2351                                 ;* EACH SYNCH IS TIMED AS IT IS RECEIVED, AND THE BITS ARE CHECKED
2352                                 ;* FOR A VALID SYNCH CHAR FOR EACH OF THE 22 SYNCHS WHICH FOLLOW
2353                                 ;* THE FIRST TWO (THESE PERFORM SYNCHRONIZATION, AND ARE NOT READ).
2354                                 ;* WHILE THE LAST SYNCH IS BEING TRANSMITTED, OC IS SET, AND THE
2355                                 ;* NEXT CHAR RCV'D AFTER THE SYNCH IS CHECKED TO BE 377 (LINE MARKING).
2356                                 ;* THEN, A MASTER CLEAR IS ISSUED.
2357                                 ;* THE SYNCH CHAR USED IS 226 (OCTAL).
2358                                 ;;*************************************************************************
2359 035142                          BGNTST
     035142                                                                  T41::
2360 035142  012737  035302  002362          MOV     #24$,RETADR     ;SET TEST EXIT ADRS FOR ERRORS
2361 035150  004737  005540                  JSR     PC,INITRN       ;MST CLR, LOAD 2 SOM'S
2362 035154  000226                          SYNCH
2363 035156  000341                          CRC2!CRC1!IDLE!DDCMP
2364 035160  012701  000026                  MOV     #22.,R1         ;INIT COUNTER
2365 035164  012737  000226  002422          MOV     #SYNCH,TXWORD
2366 035172  004737  005174          6$:     JSR     PC,LDTXSI       ;LOAD AN SOM INTO TX SILO
2367 035176  005301                          DEC     R1              ;DECR COUNTER
2368 035200  001374                          BNE     6$              ;BR IF MORE TO LOAD
2369 035202  004737  005146                  JSR     PC,WAIT50       ;ALLOW SILO TO RIPPLE
2370 035206  004737  007434                  JSR     PC,RCV1ST       ;CLK LU UNTIL 3RD SYNCH RCV'D (RCVR IS ACTIVE)
2371 035212  000030                          24.
2372 035214  012701  000025                  MOV     #21.,R1         ;INIT COUNTER
2373 035220  004737  007750          8$:     JSR     PC,CKDATA       ;READ A SYNCH, CLK NEXT ONE
2374 035224  000226                          SYNCH
2375 035226  000010                          8.
2376 035230  005301                          DEC     R1              ;DERC COUNTER
2377 035232  001372                          BNE     8$              ;BR IF NOT ALL CHECKED
2378 035234  004737  007750                  JSR     PC,CKDATA       ;CHECK LAST SYNCH
2379 035240  000226                          SYNCH
2380 035242  000004                          4
2381 035244  012737  000011  002400          MOV     #11,REGNUM      ;SET REG NO.   11
2382 035252  112737  000200  002366          MOVB    #0C,WR;BYT
```

```
 2383 035260  004737  003750                JSR     PC,WRITLU       ;SET OC IN REG 11
 2384 035264  004737  005254                JSR     PC,STPLU        ;FINISH CLOCKING CHAR, AND THEN SOME
 2385 035270  000014                        12.
 2386 035272  004737  007750                JSR     PC,CKDATA       ;RCV A MARK CHAR, CHK IT
 2387 035276  000377                        377
 2388 035300  000000                        0
 2389 035302  004737  003576          24$:  JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR TO CLEAN UP
 2390 035306                         ENDTST
      035306                                                                L10075:
      035306  104401                                                              TRAP    C$ETST
 2391
 2392
 2393
 2394
 2395
 2396                                ;;************************************************************************ **
 2397                                .SBTTL      TEST 42 - STRIP SYNCH TEST
 2398                                ;*
 2399                                ;* THE DEVICE IS ENABLED FOR TRANSMIT AND RECEIVE, AND A MESSAGE IS
 2400                                ;* INITIATED IN CHAR MODE AND WITH THE STRIP SYNCH
 2401                                ;* BIT SET. THEN 24 (DEC) SYNCHS ARE SENT
 2402                                ;* FOLLOWED BY THE FOLLOWING DATA CHARACTERS : 377, 000, 125, 252,
 2403                                ;* AND 2 TERMINATING SYNCHS.
 2404                                ;* EACH OF THE 23 SYNCHS AFTER THE FIRST ARE CHECKED AT THE TRANSMITTER OUTPUT,
 2405                                ;* BY SCANNING THE TXDATA BIT.
 2406                                ;* EACH USYRT RCV FLAG IS TIMED AS IT IS RECEIVED, AND THE 4 DATA WORDS
 2407                                ;* ARE READ AND COMPARED TO EXPECTED VALUES.
 2408                                ;* FINALLY, THE LINE UNIT IS CLOCKED FOR SEVERAL CHAR TIMES, AND A CHECK
 2409                                ;* IS MADE FOR OACT = 0 (TEOM SHOULD CAUSE TX ENABLE TO DROP).
 2410                                ;* THE ABOVE TEST IS REPEATED FOR EACH OF THE FOLLOWING SYNCH CHAR DATA
 2411                                ;* PATTERNS : 226,000,125,252,376,177.
 2412                                ;;************************************************************************
 2413 035310                        BGNTST
      035310                                                                T42::
 2414 035310  012737  035530  002362        MOV     #24$,RETADR     ;SET TEST EXIT ADRS FOR ERRORS
 2415 035316  012701  035536                MOV     #SYNPAT,R1      ;GET POINTER TO DATA
 2416 035322  011137  035332          2$:   MOV     (R1),3$         ;GET A SYNCH PATTERN
 2417 035326  004737  005540                JSR     PC,INITRN       ;MST CLR, LOAD 2 SOM'S
 2418 035332  000000                  3$:   .WORD   0               ;SYNCH PATTERN GOES HERE
 2419 035334  000311                        CRC2!CRC1!STRIP!DDCMP
 2420 035336  012737  000400  002422        MOV     #TXSOM,TXWORD
 2421 035344  012702  000026                MOV     #22.,R2         ;LOAD 22 SOM'S INTO TX SILO
 2422 035350  004737  005174          6$:   JSR     PC,LDTXSI
 2423 035354  005302                        DEC     R2
 2424 035356  001374                        BNE     6$
 2425 035360  004737  011016                JSR     PC,LODMSG       ;LOAD DATA CHARS INTO TX SILO
 2426 035364  003246                        MSG4
 2427 035366  000006                        6
 2428 035370  012737  001000  002422        MOV     #TXEOM,TXWORD
 2429 035376  004737  005174                JSR     PC,LDTXSI       ;LOAD A TEOM
 2430 035402  004737  005174                JSR     PC,LDTXSI       ;LOAD ANOTHER TEOM
 2431 035406  004737  005146                JSR     PC,WAIT50       ;ALLOW SILO TO RIPPLE
 2432 035412  011137  035434                MOV     (R1),16$        ;GET CURRENT SYNCH PATTERN
 2433 035416  012702  000027                MOV     #23.,R2         ;INIT COUNTER
 2434 035422  004737  005254                JSR     PC,STPLU        ;CLOCK OUT FIRST SYNCH
 2435 035426  100010                        CHPCHK!8.
 2436 035430  004737  011176          14$:  JSR     PC,CKTBIT       ;CHECK TX'D SYNCH
```

```
2437 035434  000000                16$:   .WORD   0              ;SYNCH PATTERN GOES HERE
2438 035436  005302                       DEC     R2             ;DECR COUNTER
2439 035440  001373                       BNE     14$            ;BR IF NOT DONE CHECKING LAST 23 SYNCHS
2440 035442  004737  007434               JSR     PC,RCV1ST      ;CLOCK UNTIL 000 CHAR RCV'D
2441 035446  000010                       8.
2442 035450  004737  007750               JSR     PC,CKDATA      ;RCV 377, CLOCK 000
2443 035454  000377                       377
2444 035456  000010                       8.
2445 035460  004737  007750               JSR     PC,CKDATA      ;RCV 000, CLK 125
2446 035464  000000                       000
2447 035466  000010                       8.
2448 035470  004737  007750               JSR     PC,CKDATA      ;RCV 125, CLK 252
2449 035474  000125                       125
2450 035476  000010                       8.
2451 035500  004737  007750               JSR     PC,CKDATA      ;RCV 252, CLK END OF MSG
2452 035504  000252                       252
2453 035506  000040                       32.
2454 035510  004737  005352               JSR     PC,OACTIV      ;CHK FOR OACT = 0
2455 035514  000000                       0
2456 035516  062701  000002               ADD     #2,R1          ;INIT SYNCH PATTERN POINTER
2457 035522  020127  035552               CMP     R1,#SYNPAT+12. ;SEE IF ALL PATTERNS CHECKED YET
2458 035526  103675                       BLO     2$             ;BR IF NOT YET
2459 035530  004737  003576        24$:   JSR     PC,MSTCLR      ;ISSUE MASTER CLEAR TO CLEAN UP
2460 035534                       END^ST
     035534                                                                L10076:
     035534  104401                                                              TRAP    C$ETST
2461
2462 035536  000226                SYNPAT: 226
2463 035540  000000                        000
2464 035542  000125                        125
2465 035544  000252                        252
2466 035546  000376                        376
2467 035550  000177                        177
2468
2469
2470
2471
2472
```

HARDWARE PARAMETER CODING SECTION

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

 035552                                 BGNHRD
 035552  000022                                                                .WORD L10077-L$HARD/2
 035554                                                                 L$HARD::
 035554                                 GPRMA   ADDRES,2,0,160000,177776,YES
 035554  001031                                                                .WORD   T$CODE
 035556  035620                                                                .WORD   ADDRES
 035560  160000                                                                .WORD   T$LOLIM
 035562  177776                                                                .WORD   T$HILIM
 035564                                 GPRMA   VECTOR,4,0,0,674,YES
 035564  002031                                                                .WORD   T$CODE
 035566  035646                                                                .WORD   VECTOR
 035570  000000                                                                .WORD   T$LOLIM
 035572  000674                                                                .WORD   T$HILIM
 035574                                 GPRMD   PRIRTY,6,0,7000,4,7,YES
 035574  003032                                                                .WORD   T$CODE
 035576  035677                                                                .WORD   PRIRTY
 035600  007000                                                                .WORD   7000
 035602  000004                                                                .WORD   T$LOLIM
 035604  000007                                                                .WORD   T$HILIM
 035606                                 GPRMD   ISRUN,24,0,7,0,7,YES
 035606  012032                                                                .WORD   T$CODE
 035610  035730                                                                .WORD   ISRUN
 035612  000007                                                                .WORD   7
 035614  000000                                                                .WORD   T$LOLIM
 035616  000007                                                                .WORD   T$HILIM

 035620                                 ENDHRD
                                                                        .EVEN
 035620                                                                 L10077:

 035620      104     105     126  ADDRES: .ASCIZ  /DEVICE CSR ADDRESS : /
 035623      111     103     105
 035626      040     103     123
 035631      122     040     101
 035634      104     104     122
 035637      105     123     123
 035642      040     072     040
 035645      000
 035646      104     105     126  VECTOR: .ASCIZ  /DEVICE VECTOR ADDRESS : /
 035651      111     103     105
 035654      040     126     105
 035657      103     124     117
 035662      122     040     101
```

```
                035665  104     104     122
                035670  105     123     123
                035673  040     072     040
                035676  000
     25         035677  104     105     126     PRIRTY: .ASCIZ  /DEVICE PRIORITY LEVEL : /
                035702  111     103     105
                035705  040     120     122
                035710  111     117     122
                035713  111     124     131
                035716  040     114     105
                035721  126     105     114
                035724  040     072     040
                035727  000
     26         035730  115     070     062     ISRUN:  .ASCIZ  /M8207 RUN SWITCH (E28 SW7) - TYPE 0 IF OFF, 1 IF ON : /
                035733  060     067     040
                035736  122     125     116
                035741  040     123     127
                035744   11     124     103
                035747  110     040     050
                035752  105     062     070
                035755  040     123     127
                035760  067     051     040
                035763  055     040     124
                035766  131     120     105
                035771  040     060     040
                035774  111     106     040
                035777  117     106     106
                036002  054     040     061
                036005  040     111     106
                036010  040     117     116
                036013  040     072     040
                036016  000
     27                                         .EVEN
     28
     29
     30
     31
     32
     33
```

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

036020                                  BGNSFT
036020  000000                                                            .WORD L10100-L$SOFT/2
036022                                                                  L$SOFT::

036022                                  ENDSFT
                                                                        .EVEN
036022                                                                  L10100:

                                .EVEN


                                ;****** PATCH AREA FOR DEBUG ******
036022                          PATCH:
        036222                          .=.+200
036222  000240                          NOP
036224  000240                          NOP
036226  000240                          NOP
                                ;************************************


                                ENDMOD

036230

                                LASTAD
                                                                        .EVEN
036230  000000                                                          .WORD   0
036232  000000                                                          .WORD   0
036234                          L$LAST::

        000001                  .END
```

SYMBOL TABLE

```
ABORT = 000004          BIT7  = 000200 G      C$OPEN= 000034          EM23   012775          EVL   = 000004 G
ADDRES  035620          BIT8  = 000400 G      C$PNTB= 000014          EM24   013016          E$END = 002100
ADR   = 000020 G        BIT9  = 001000 G      C$PNTF= 000017          EM25   013033          E$LOAD= 000035
ANBITS  002561          BOE   = 000400 G      C$PNTS= 000016          EM26   013067          FMT1    011454
APA   = 000200          BPOLL = 000100        C$PNTX= 000015          EM27   013121          FMT10   011717
ASBC0 = 000020          BSEL1   002450        C$QIO = 000377          EM28   013152          FMT11   011750
ASBC1 = 000040          BSEL2   002452        C$RDBU= 000007          EM29   013173          FMT19   012007
ASBC2 = 000100          BSEL4   002454        C$REFG= 000047          EM3    012220          FMT2    011464
ASSEMB= 000010          CARR  = 000001        C$RESE= 000033          EM30   013210          FMT24   012040
AXNUM   002402          CHPCHK= 100000        C$REVI= 000003          EM31   013231          FMT27   021600
AX0.15= 002322          CHPTYP  002430        C$RFLA= 000021          EM32   013246          FMT3    011506
AX0.16= 002324          CKDATA  007750        C$RPT = 000025          EM33   013275          FMT4    011550
AX1   = 000001          CKTBIT  011176        C$SEFG= 000046          EM34   013320          FMT5    011563
AX1.15= 002326          CRCCHK= 100000        C$SPRI= 000041          EM35   013346          FMT6    011613
AX1.16= 002330          CRCTY0= 000001        C$SVEC= 000037          EM36   013366          FMT7    011646
AX2   = 000002          CRCTY1= 000002        C$TPRI= 000013          EM37   013402          FMT8    011656
AX2.15= 002332          CRCTY2= 000004        C32BCC= 000040          EM38   013423          FMT9    011712
AX2.16= 002334          CRC1  = 000100        C32ENB= 000004          EM39   013440          FRSTIM  002412
AX3.15= 002336          CRC2  = 000200        DDC   = 000100          EM4    012237          F$AU  = 000015
AX3.16= 002340          CS    = 000004        DDCMP = 000001          EM40   013460          F$AUTO= 000020
AX315U= 000372          C$AU  = 000052        DEVMAP  002434          EM41   013474          F$BGN = 000040
A1      024220          C$AUTO= 000061        DEVPTR  002436          EM42   013515          F$CLEA= 000007
A10     034202          C$BRK = 000022        DFPTBL  002252 G        EM43   013532          F$DU  = 000016
A2      026626          C$BSEG= 000004        DH1     014264          EM44   013557          F$END = 000041
A3      027306          C$BSUB= 000002        DH2     014306          EM45   013604          F$HARD= 000004
A4      027422          C$CEFG= 000045        DH3     014335          EM46   013631          F$HW  = 000013
A5      027532          C$CLCK= 000062        DH4     014373          EM47   013664          F$INIT= 000006
A6      027726          C$CLEA= 000012        DH5     014435          EM48   013717          F$JMP = 000050
A7      030272          C$CLOS= 000035        DH6     014440          EM49   013752          F$MOD = 000000
A8      030506          C$CLP1= 000006        DH7     014443          EM5    012312          F$MSG = 000011
A9      031036          C$CVEC= 000036        DH8     014475          EM50   014011          F$PROT= 000021
BADDAT  002406          C$DCLN= 000044        DH9     014534          EM51   014045          F$PWR = 000017
BCC   = 000001          C$DODU= 000051        DIAGMC= 000000          EM52   014105          F$RPT = 000012
BCCCHK= 100000          C$DRPT= 000024        DISILO  002426          EM53   014146          F$SEG = 000003
BIT0  = 000001 G        C$DU  = 000053        DISSI = 000040          EM54   014206          F$SOFT= 000005
BIT00 = 000001 G        C$EDIT= 000003        DTR   = 000100          EM6    012343          F$SRV = 000010
BIT01 = 000002 G        C$ERDF= 000055        EBLK  = 000002          EM60   014230          F$SUB = 000002
BIT02 = 000004 G        C$ERHR= 000056        EF.CON= 000036 G        EM65   014244          F$SW  = 000014
BIT03 = 000010 G        C$ERPO= 000060        EF.NEW= 000035 G        EM7    012374          F$TEST= 000001
BIT04 = 000020 G        C$ERSF= 000054        EF.PWR= 000034 G        EM8    012411          GETALL  004526
BIT05 = 000040 G        C$ERSO= 000057        EF.RES= 000037 G        EM9    012432          GETPRM  021306
BIT06 = 000100 G        C$ESCA= 000010        EF.STA= 000040 G        ENAX  = 000004          GETREG  004016
BIT07 = 000200 G        C$ESEG= 000005        EM1     012125          ENDIT   021464          GOAH  = 000010
BIT08 = 000400 G        C$ESUB= 000003        EM10    012447          ENDPAT  003220          GOODAT  002404
BIT09 = 001000 G        C$ETST= 000001        EM11    012470          ENDTRN  006274          G$CNTO= 000200
BIT1  = 000002 G        C$EXIT= 000032        EM12    012505          EOM   = 000002          G$DELM= 000372
BIT10 = 002000 G        C$GETB= 000026        EM13    012526          ERRFLG  002356          G$DISP= 000003
BIT11 = 004000 G        C$GETW= 000027        EM14    012556          ERROR1  002420          G$EXCP= 000400
BIT12 = 010000 G        C$GMAN= 000043        EM15    012573          ERR1    014600 G        G$HILI= 000002
BIT13 = 020000 G        C$GPHR= 000042        EM16    012622          ERR2    014632 G        G$LOLI= 000001
BIT14 = 040000 G        C$GPLO= 000030        EM17    012643          ERR3    015140 G        G$NO  = 000000
BIT15 = 100000 G        C$GPRI= 000040        EM18    012660          ERR4    015622 G        G$OFFS= 000400
BIT2  = 000004 G        C$INIT= 000011        EM19    012701          ERR5    016300 G        G$OFSI= 000376
BIT3  = 000010 G        C$INLP= 000020        EM2     012161          ERR6    017012 G        G$PRMA= 000001
BIT4  = 000020 G        C$MANI= 000050        EM20    012716          ERR7    017470 G        G$PRMD= 000002
BIT5  = 000040 G        C$MEM = 000031        EM21    012737          ERR8    020122 G        G$PRML= 000000
BIT6  = 000100 G        C$MSG = 000023        EM22    012754          ERR9    020630 G        G$RADA= 000140
```

SYMBOL TABLE

```
G$RADB= 000000          LUREG   002302          L$SOFT  036022 G        L10061  031136          PATH    002654
G$RADD= 000040          LUR10 = 002302          L$SPC   002056 G        L10062  031506          PATI    002664
G$RADL= 000120          LUR11 = 002304          L$SPCP  002020 G        L10063  032050          PATJ    002674
G$RADO= 000020          LUR12 = 002306          L$SPTP  002024 G        L10064  032320          PATK    002704
G$XFER= 000004          LUR13 = 002310          L$STA   002030 G        L10065  032662          PATL    003014
G$YES = 000010          LUR14 = 002312          L$SW    002302 G        L10066  033012          PATM    003022
HDX   = 000020          LUR15 = 002314          L$TEST  002114 G        L10067  033724          PATN    003032
HELP  = 000001          LUR16 = 002316          L$TIML  002014 G        L10070  034206          PATO    003050
HOE   = 100000 G        LUR17 = 002320          L$UNIT  002012 G        L10071  034406          PATP    003066
IACT  = 000100          LUSWI1  002466          L10000  002300          L10072  034706          PATU    003104
IACTIV  006714          LUSWI2  002470          L10001  002302          L10073  034776          PATV    003152
IBE   = 010000 G        LUSWI3  002472          L10002  014630          L10074  035140          PNT   = 001000 G
IC    = 000200          LU1MOD  002000 G        L10003  015136          L10075  035306          POLL  = 000200
ICIR  = 000010          L$ACP   002110 G        L10004  015620          L10076  035534          PRI   = 002000 G
IDL   = 000010          L$APT   002036 G        L10005  016276          L10077  035620          PRIOR   002350
IDLE  = 000040          L$AU    021632 G        L10006  017010          L10100  036022          PRIRTY  035677
IDU   = 000040 G        L$AUT   002070 G        L10007  017466          MAINT1= 000010          PRI00 = 000000 G
IER   = 020000 G        L$AUTO  021466 G        L10010  020120          MAINT2= 000004          PRI01 = 000040 G
IERR  = 000002          L$CCP   002106 G        L10011  020626          MCLK  = 000002          PRI02 = 000100 G
INITRN  005540          L$CLEA  021546 G        L10012  021104          MCLR  = 000100          PRI03 = 000140 G
INTFLG  002354          L$CO    002032 G        L10013  021106          MODR  = 000010          PRI04 = 000200 G
INTGRL= 000010          L$DEPO  002011 G        L10015  021464          MPCSR   002446          PRI05 = 000240 G
IRDY  = 000020          L$DESC  003470 G        L10016  021544          MPIVEC  002460          PRI06 = 000300 G
ISIRDY  006430          L$DESP  002076 G        L10017  021546          MPOVEC  002462          PRI07 = 000340 G
ISR   = 000100 G        L$DEVP  002060 G        L10020  021576          MPRIOR  002464          PSTACK  002346
ISRUN   035730          L$DISP  002124 G        L10021  021632          MSG1    003220          RAB   = 000004
IXE   = 004000 G        L$DLY   002116 G        L10022  021714          MSG4    003246          RABT  = 000004
I$AU  = 000041          L$DTP   002040 G        L10023  022000          MSTCLR  003576          RAX15   002370
I$AUTO= 000041          L$DTYP  002034 G        L10024  022124          MVIOX = 021000          RAX16   002372
I$CLN = 000041          L$DU    021550 G        L10025  022226          MVIXO = 122000          RCVBUF  003262
I$DU  = 000041          L$DUT   002072 G        L10026  022354          MVIXOX= 121000          RCV1ST  007434
I$HRD = 000041          L$DVTY  003462 G        L10027  022474          NEWST   021266          RDALL = 000004
I$INIT= 000041          L$EF    002052 G        L10030  022650          OACT  = 000100          RDAX  = 000020
I$MOD = 000041          L$ENVI  002044 G        L10031  023104          OACTIV  005352          RDRXSI  007354
I$MSG = 000041          L$ETP   002102 G        L10032  023222          OC    = 000200          READAX  004124
I$PROT= 000040          L$EXP1  002046 G        L10033  023340          OCOR  = 000020          READLU  003672
I$PTAB= 000041          L$EXP4  002064 G        L10034  023456          OP    = 000002          READY = 000200
I$PWR = 000041          L$EXP5  002066 G        L10035  023574          ORDY  = 000020          REDBYT  002364
I$RPT = 000041          L$HARD  035554 G        L10036  024224          OSIRDY  004662          REDDAT  002500
I$SEG = 000041          L$HIME  002120 G        L10037  024556          OVRR  = 000010          REGNUM  002400
I$SETU= 000041          L$HPCP  002016 G        L10040  025046          O$APTS= 000000          REG0    002510
I$SFT = 000041          L$HPTP  002022 G        L10041  025256          O$AU  = 000001          REG1    002512
I$SRV = 000041          L$HW    002252 G        L10042  025462          O$BGNR= 000000          REG2    002514
I$SUB = 000041          L$ICP   002104 G        L10043  025666          O$BGNS= 000000          REG3    002516
I$TST = 000041          L$INIT  021116 G        L10044  026124          O$DU  = 000001          REG4    002520
I422  = 000200          L$LADP  002026 G        L10045  026356          O$ERRT= 000000          REG5    002522
J$JMP = 000167          L$LAST  036234 G        L10046  026262          O$GNSW= 000000          REG6    002524
LDMSG1  011374          L$LOAD  002100 G        L10047  026354          O$POIN= 000001          REG7    002526
LDTXSI  005174          L$LUN   002074 G        L10050  026630          O$SETU= 000000          REOM  = 000002
LOADAT  002410          L$MREV  002050 G        L10051  026626          PATA    002571          RERR  = 000200
LODMSG  011016          L$NAME  002000 G        L10052  027306          PATB    002615          RETADR  002362
LOE   = 040000 G        L$PRIO  002042 G        L10053  027426          PATC    002625          RING  = 000200
LOGDEV  002344          L$PROT  002110 G        L10054  027536          PATCH   036C 2          ROMI  = 000002
LOOPIN  004074          L$PRT   002112 G        L10055  027732          PATD    002630          ROMO  = 000004
LOT   = 000010 G        L$REPP  002062 G        L10056  030276          PATE    002633          ROR   = 000010
LULOOP= 000010          L$REV   002010 G        L10057  030506          PATF    002641          RRDYTO= 000001
LILP  = 000040          L$RPT   021106 G        L10060  031036          PATG    002644          RSEOM   007102
```

SYMBOL TABLE

```
RSOM   = 000001        STPCLK  003540        TXABT  = 002000        T$TEMP= 000000        T29     031040 G
RTS    = 000040        STPERR  007646        TXCHAR  006122        T$TEST= 000052        T3      022002 G
RU     = 000200        STPLU   005254        TXDATA= 000040        T$TSTM= 177777        T30     031140 G
RUNINH  002476         STR    = 000040        TXEN   = 000100        T$TSTS= 000001        T31     031510 G
RXABT  = 002000        STRIP  = 000010        TXEOM  = 001000        T$$AU  = 010021        T32     032052 G
RXBCC  = 000400        SUBRPC  002352        TXGA   = 000010        T$$AUT= 010016        T33     032322 G
RXCHAR  011074         SVCGBL= 000000        TXGOA  = 004000        T$$CLE= 010017        T34     032664 G
RXEBL  = 001000        SVCINS= 000001        TXLEN0= 000040        T$$DU  = 010020        T35     033014 G
RXLEN0= 000001         SVCSUB= 000001        TXLEN1= 000100        T$$HAR= 010077        T36     033726 G
RXLEN1= 000002         SVCTAG= 000001        TXLEN2= 000200        T$$HW  = 010000        T37     034210 G
RXLEN2= 000004         SVCTST= 000001        TXSOM  = 000400        T$$INI= 010015        T38     034410 G
RXOVR  = 004000        SW0    = 000002        TXWORD  002422         T$$MSG= 010012        T39     034710 G
RXWORD  002424         SW1    = 000004        TX0    = 000001        T$$PRO= 010014        T4      022126 G
RX0    = 000001        SW2    = 000010        TX1    = 000002        T$$RPT= 010013        T40     035000 G
RX1    = 000002        SW3    = 000040        TX2    = 000004        T$$SEG= 010000        T41     035142 G
RX2    = 000004        SYNCH  = 000226        TX3    = 000010        T$$SOF= 010100        T42     035310 G
RX3    = 000010        SYNPAT  035536         TX4    = 000020        T$$SUB= 010051        T5      022230 G
RX4    = 000020        SYN0   = 000001        TX5    = 000040        T$$SW  = 010001        T6      022[illegible] G
RX5    = 000040        SYN1   = 000002        TX6    = 000100        T$$TES= 010076        T7      022476 G
RX6    = 000100        SYN2   = 000004        TX7    = 000200        T1      021634 G      T8      022652 G
RX7    = 000200        SYN3   = 000010        T$ARGC= 000001        T10     023224 G      T9      023106 G
R14NRW  002560         SYN4   = 000020        T$CODE= 012032        T11     023342 G      UAM    = 000200 G
SAVE4   002414         SYN5   = 000040        T$ERRN= 000032        T12     023460 G      UNIT    002440
SAVE6   002416         SYN6   = 000100        T$EXCP= 000000        T13     023576 G      UNRR   = 000001
SAVLEN  002432         SYN7   = 000200        T$FLAG= 000040        T14     024226 G      UPBITS  002550
SCRACH  002342         S$LSYM= 010000        T$GMAN= 000000        T15     024560 G      VECTOR  035646
SEC    = 000020        TEOM   = 000002        T$HILI= 000007        T16     025050 G      V35    = 000020
SECA   = 000020        TERR   = 000200        T$LAST= 000001        T17     025260 G      WAIT50  005146
SELFR  = 000040        TEST   = 000001        T$LOLI= 000000        T18     025464 G      WAX    = 000010
SELSBY= 000002         TESTMD= 000004        T$LSYM= 010000        T19     025670 G      WAX15   002374
SEL4    002454         TIMFLG  002360        T$LTNO= 000052        T2      021716 G      WAX16   002376
SEL6    002456         TMP0    002530        T$NEST= 177777        T20     026126 G      WRDYTO= 000002
SETUP   010640         TMP1    002532        T$NS0  = 000000        T20.1   026156        WRIBYT  002366
SFPTBL  002302 G       TMP2    002534        T$NS1  = 000005        T20.2   026264        WRITAX  004312
SIGQ   = 000100        TMP3    002536        T$NS2  = 000002        T21     026360 G      WRITLU  003750
SIGR   = 000200        TMP4    002540        T$NS3  = 000003        T21.1   026372        XYZ    = 000100
SOM    = 000001        TMP5    002542        T$PTNU= 000000        T22     026632 G      X$ALWA= 000000
STALL   005164         TMP6    002544        T$SAVL= 177777        T23     027310 G      X$FALS= 000040
STARES  002444         TMP7    002546        T$SEGL= 177777        T24     027430 G      X$OFFS= 000400
STARST  021256         TSOM   = 000001        T$SEK0= 010000        T25     027540 G      X$TRUE= 000020
STBY   = 000002        TSTCON  002474        T$SUBN= 000000        T26     027734 G      $LSTIN= 000001
STEPLU= 000020         TSTNUM  002442        T$TAGL= 177777        T27     030300 G      $LSTTA= 000001
STEPMP= 000001         TXAB   = 000004        T$TAGN= 010101        T28     030510 G

. ABS.  036234      000
        000000      001
ERRORS DETECTED:  0

VIRTUAL MEMORY USED:  21669 WORDS  ( 85 PAGES)
DYNAMIC MEMORY AVAILABLE FOR  69 PAGES
CZDMRD.BIC,CZDMRD.SEQ/C/N:TOC=SVC34R.MLB,CZDMRD.P11
```

CROSS REFERENCE TABLE (CREF V01-05)

```
$LSTIN   7-27#
$LSTTA   7-28#
A'      24-457   24-483   24-502   24-511   24-521#
A10     24-D59   24-E34#
A2      24-959   24-998#
A3      24-:23   24-;27   24-;31#
A4      24-;53   24-;79#
A5      24-<02   24-<25#
A6      24-<50   24-<85#
A7      24-=11   24-=27   24-=36   24-=48   24-=67   24-=71   24-=75#
A8      24-=92   24->31#
A9      24->49   24-?11#
ABORT   12-61#
ADDRES  16-101   16-107   16-122   16-142   16-160   16-181   16-199   16-218   16-237   25-16    25-23#
ADR     12-20#
ANBITS  13-112#  24-684   24-685   24-735   24-736   24-782   24-783
APA     12-239#
ASBC0   12-196#
ASBC1   12-195#
ASBC2   12-194#
ASSEMB   7-18     7-18
AX0.15  12-309#  15-235   16-131   16-150   16-170   16-189   16-207   16-227
AX0.16  12-310#  16-131   16-150   16-170   16-189   16-207   16-227
AX1     12-92#   12-164#
AX1.15  12-311#  16-131   16-150   16-170   16-189   16-207   16-227
AX1.16  12-312#  16-131   16-150   16-170   16-189   16-207   16-227
AX2     12-91#   12-163#
AX2.15  12-313#  16-133   16-152   16-172   16-191   16-209   16-229
AX2.16  12-314#  16-133   16-152   16-172   16-191   16-209   16-229
AX3.15  12-315#  16-133   16-152   16-172   16-191   16-209   16-229
AX3.16  12-316#  16-133   16-152   16-172   16-191   16-209   16-229
AX315U  12-259#  24-569   24-629   24-846
AXNUM   13-33#   15-152   15-190   15-203   15-228   15-230   15-236*  15-242*  15-243   15-245*  15-247   15-438   15-446*  15-489*
        15-685   15-691*  15-720*  15-726*  15-967   15-969*  15-977*  15-986*  24-541*  24-553*  24-557*  24-567   24-579*  24-590*
        24-618*  24-625*  24-627   24-639*  24-681*  24-696*  24-732*  24-747*  24-779*  24-794*  24-839*  24-857*  24-894*  24-974*
        24-985*  24-:90*  24-=96*  24->62*  24-?72*  24-@52*  24-A35*  24-A98*  24-B77*  24-C26*  24-C82*  24-E64*  24-F16*
BADDAT  13-35#   15-857*  15-858*  15-879*  15-E`0*  16-110   16-125   16-164   16-221   24-47*   24-81*   24-112*  24-145*  24-181*
        24-223*  24-275*  24-311*  24-345*  24-379*  24-413*  24-477*  24-496*  24-515*  24-574*  24-585*  24-634*  24-644*  24-691*
        24-701*  24-742*  24-751*  24-789*  24-798*  24-852*  24-862*  24-910*  24-933*  24-980*  24-990*  24-:95*  24-;18*  24-?94*
        24-@09*  24-@92*  24-A57*  24-B38*  24-B82*  24-C86*
BCC     12-140#  15-883   15-885   15-891
BCCCHK  12-324#  15-881
BIT0    12-20#   12-42    12-54    12-63    12-92    12-104   12-116   12-128   12-140   12-152   12-164   12-176   12-188   12-200
        12-212   12-221   12-233   12-246   12-258   12-269   12-341   15-230   15-271   15-400   15-612   15-653   15-693   15-:61
        19-44
BIT00   12-20    12-20#
BIT01   12-20    12-20#
BIT02   12-20    12-20#
BIT03   12-20    12-20#
BIT04   12-20    12-20#
BIT05   12-20    12-20#
BIT06   12-20    12-20#
BIT07   12-20    12-20#
BIT08   12-20    12-20#
BIT09   12-20    12-20#
BIT1    12-20#   12-41    12-53    12-62    12-81    12-91    12-103   12-115   12-127   12-139   12-151   12-163   12-175   12-187
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CROSS REFERENCE TABLE (CREF V01-05)

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        12-199  12-211  12-220  12-232  12-245  12-257  12-268  12-342  15-287  15-596  15-707
BIT10   12-20#  12-279  12-291
BIT11   12-20#  12-278  12-290
BIT12   12-20#
BIT13   12-20#
BIT14   12-20#
BIT15   12-20#  12-322  12-324  12-325  15-368  15-522
BIT2    12-20#  12-40   12-52   12-61   12-80   12-90   12-102  12-114  12-126  12-138  12-150  12-162  12-174  12-186
        12-198  12-210  12-219  12-231  12-244  12-256  12-267
BIT3    12-20#  12-39   12-51   12-60   12-79   12-89   12-101  12-113  12-125  12-137  12-149  12-161  12-173  12-185
        12-197  12-209  12-218  12-230  12-243  12-255
BIT4    12-20#  12-38   12-50   12-78   12-88   12-100  12-112  12-124  12-136  12-148  12-160  12-172  12-184  12-196
        12-208  12-229  12-242  12-254
BIT5    12-20#  12-49   12-70   12-77   12-87   12-99   12-111  12-123  12-135  12-147  12-159  12-171  12-183  12-195
        12-207  12-228  12-241  12-253  12-266
BIT6    12-20#  12-37   12-48   12-69   12-76   12-86   12-98   12-110  12-122  12-134  12-146  12-158  12-170  12-182
        12-194  12-206  12-227  12-240  12-252  12-265
BIT7    12-20#  12-36   12-47   12-59   12-68   12-75   12-97   12-109  12-121  12-133  12-145  12-157  12-169  12-181
        12-193  12-205  12-217  12-226  12-239  12-251  12-264  15-851  15-852
BIT8    12-20#  12-281  12-293
BIT9    12-20#  12-280  12-292
BOE     12-20#
BPOLL   12-69#
BSEL1   13-54#  15-16*  15-18*  15-19*  15-33*  15-34*  15-39*  15-131* 15-133* 15-234* 15-372* 15-373* 15-375* 15-465*
        15-466* 15-471* 15-484* 19-59*  19-60*  19-61   24-134* 24-834*
BSEL2   13-55#  19-61*  19-62*  24-470  24-490  24-509
BSEL4   13-56#  15-69   15-90*  24-173*
C$AU     7-18#  23-10
C$AUTO   7-18#  20-19
C$BRK    7-18#
C$BSEG   7-18#  24-72   24-303  24-337  24-371  24-405  24-680  24-731  24-778  24-838  24-900
C$BSUB   7-18#  24-898  24-924  24-960
C$CEFG   7-18#
C$CLCK   7-18#
C$CLEA   7-18#  21-11
C$CLOS   7-18#
C$CLP1   7-18#
C$CVEC   7-18#
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C$DODU   7-18#  20-16
C$DRPT   7-18#
C$DU     7-18#  22-13
C$EDIT   7-18#   8-17
C$ERDF   7-18#  15-277  15-283  15-293  15-299  15-406  15-412  15-570  15-602  15-608  15-618  15-624  15-659  15-665
        15-699  15-705  15-713  15-719  15-865  15-870  15-889  15-895  15-904  15-910  15-919  15-925  15-934  15-940
        15-:72  15-:78  24-24   24-50   24-84   24-115  24-148  24-184  24-226  24-278  24-314  24-348  24-382  24-416
        24-480  24-499  24-518  24-551  24-565  24-577  24-588  24-637  24-647  24-694  24-704  24-745  24-754  24-792
        24-801  24-855  24-865  24-913  24-936  24-983  24-993  24-:98  24-;21  24-<83  24-=26  24-=35  24-=47  24-=66
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C$ERHR   7-18#
C$ERRO   7-18#
C$ERSF   7-18#
C$ERSO   7-18#
C$ESCA   7-18#  24-227  24-279  24-552  24-566  24-578  24-589  24-638  24-648  24-695  24-746  24-793  24-856  24-984
        24-994  24-:99  24-;22
C$ESEG   7-18#  24-86   24-316  24-350  24-384  24-418  24-706  24-756  24-803  24-867  24-915
C$ESUB   7-18#  24-920  24-938  24-999
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CROSS REFERENCE TABLE (CREF V01-05)

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        24-594  24-655  24-710  24-760  24-807  24-872  24-939  24-:00  24-;32  24-;81  24-<27  24-<87  24-=76  24->32
        24-?12  24-?47  24-@27  24-A10  24-A73  24-B56  24-B88  24-D34  24-E35  24-E87  24-F55  24-F87  24-G40  24-G90
        24-H60
C$EXIT   7-18#
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C$GETW   7-18#
C$GMAN   7-18#
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C$GPLO   7-18#
C$GPRI   7-18#
C$INIT   7-18#  19-74
C$INLP   7-18#
C$MANI   7-18#
C$MEM    7-18#
C$MSG    7-18#  16-102  16-115  16-134  16-153  16-173  16-192  16-210  16-230  16-244
C$OPEN   7-18#
C$PNTB   7-18#  16-101  16-107  16-108  16-109  16-110  16-122  16-123  16-124  16-125  16-141  16-142  16-143  16-144
        16-160  16-161  16-162  16-163  16-164  16-180  16-181  16-182  16-183  16-199  16-200  16-201  16-217  16-218
        16-219  16-220  16-221  16-237  16-238  16-239
C$PNTF   7-18#  22-12   24-456  24-482  24-501  24-520
C$PNTS   7-18#
C$PNTX   7-18#  16-111  16-112  16-113  16-114  16-126  16-127  16-128  16-129  16-130  16-131  16-132  16-133  16-145
        16-146  16-147  16-148  16-149  16-150  16-151  16-152  16-165  16-166  16-167  16-168  16-169  16-170  16-171
        16-172  16-184  16-185  16-186  16-187  16-188  16-189  16-190  16-191  16-202  16-203  16-204  16-205  16-206
        16-207  16-208  16-209  16-222  16-223  16-224  16-225  16-226  16-227  16-228  16-229  16-240  16-241  16-242
        16-243
C$QIO    7-18#
C$RDBU   7-18#
C$REFG   7-18#  19-25   19-28   19-31   19-34
C$RESE   7-18#   7-18#  22-10   24-133
C$REVI   7-18#   8-17
C$RFLA   7-18#
C$RPT    7-18#  17-11
C$SEFG   7-18#
C$SPRI   7-18#  20-9    24-16
C$SVEC   7-18#
C$TPRI   7-18#
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C32ENB  12-256#
CARR    12-152#
CHPCHK  12-322#  24-;59  24-<08  24-<59  24-=17  24-=58  24->02  24->55  24-?39  24-E69  24-G21  24-H35
CHPTYP  13-44#   15-369  15-479*  15-483*  15-523  19-13*  24-C43  24-C65
CKDATA  15-842#  24-D85  24-E14  24-F80  24-F83  24-G24  24-G27  24-G30  24-G33  24-G36  24-G73  24-G78  24-G86  24-H42
        24-H45  24-H48  24-H51
CKTBIT  15-:57#  24-?41  24-G22  24-H36
CRC1    12-98#   24-<53  24-A31  24-A94  24-C13  24-E57  24-F09  24-F74  24-G12  24-G63  24-H19
CRC2    12-97#   24-<53  24-A31  24-A94  24-C13  24-E57  24-F09  24-F74  24-G12  24-G63  24-H19
CRCCHK  12-325#  15-;12
CRCTY0  12-246#
CRCTY1  12-245#
CRCTY2  12-244#
CS      12-150#
DDC     12-240#
DDCMP   12-104#  12-176#  24-;56  24-<53  24-=14  24-=55  24-=95  24-?30  24-?68  24-A31  24-D72  24-E57  24-F74  24-G63
        24-H19
DEVMAP  13-46#   19-40*  19-55*
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CROSS REFERENCE TABLE (CREF V01-05)

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DH3     16-86#   16-111   16-126   16-145   16-165   16-184   16-202   16-222   16-240
DH4     16-87#   16-113   16-128   16-147   16-167   16-186   16-204   16-224   16-242
DH5     15-229   16-88#
DH6     15-232   16-89#
DH7     16-90#   16-130   16-149   16-169   16-188   16-206   16-226
DH8     16-91#   16-130   16-149   16-169   16-188   16-206   16-226
DH9     16-92#   16-132   16-151   16-171   16-190   16-208   16-228
DIAGMC   7-18     7-18
DISILO  13-43#   15-155   15-192   15-206   19-12*   24-B74*  24-B86*  24-C19*  24-D32*
DISSI   12-87#   12-159#  24-B72   24-B74   24-C17   24-C19   24-D24
DTR     12-76#   12-146#
ESEND    7-18#
ESLOAD   7-18#    8-17
EBLK    12-139#  15-898   15-900   15-906
EF.CON  12-20#   19-34
EF.NEW  12-20#   19-31
EF.PWR  12-20#
EF.RES  12-20#   19-28
EF.STA  12-20#   19-25
EM1     16-25#   24-24
EM10    15-299   16-34#
EM11    15-406   16-35#
EM12    15-412   16-36#
EM13    16-37#   24-=47
EM14    16-38#   24-=35   24-=66
EM15    16-39#   24-=74
EM16    16-40#   24-=26
EM17    15-602   16-41#
EM18    15-608   16-42#
EM19    15-618   16-43#
EM2     16-26#   24-50    24-115   24-226   24-577   24-588   24-936
EM20    15-624   16-44#
EM21    15-659   16-45#
EM22    15-665   16-46#
EM23    16-47#
EM24    16-48#
EM25    16-49#
EM26    16-50#   24-?97   24-@95   24-A60   24-B41   24-C89
EM27    16-51#   24-@12
EM28    15-705   16-52#
EM29    15-699   16-53#
EM3     16-27#   24-84    24-184   24-278   24-314   24-348   24-382   24-416   24-637   24-647   24-694   24-704   24-745   24-754
        24-792   24-801   24-855   24-865   24-913   24-983   24-993   24-:98   24-;21   24-B85
EM30    15-719   16-54#
EM31    15-713   16-55#
EM32    15-:72   16-56#
EM33    15-:78   16-57#
EM34    15-870   16-58#
EM35    15-889   16-59#
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EM37    15-904   16-61#
EM38    15-910   16-62#
EM39    15-919   16-63#
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CROSS REFERENCE TABLE (CREF V01-05)

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EM42    15-940   16-66#
EM43    16-67#
EM44    16-68#
EM45    16-69#
EM46    16-70#
EM47    16-71#
EM48    16-72#
EM49    16-73#
EM5     16-29#   24-480   24-518
EM50    16-74#
EM51    16-75#
EM52    16-76#   24-551
EM53    16-77#   24-565
EM54    15-865   16-78#
EM6     16-30#   24-499
EM60    16-79#   24-<83
EM65    15-570   16-80#
EM7     15-277   16-31#
EM8     15-283   16-32#
EM9     15-293   16-33#
ENAX    12-90#   12-162#  15-154   15-205
ENDIT   19-35    19-73#
ENDPAT  13-452#
ENDTRN  15-552#  24-;78   24-<24   24-<84   24->30   24-?10
EOM     12-62#
ERR1    16-100#  24-24
ERR2    16-106#  24-50    24-84    24-115   24-148   24-184   24-226   24-278   24-314   24-348   24-382   24-416   24-480   24-499
        24-518
ERR3    16-121#  24-577   24-588   24-637   24-647   24-694   24-704   24-745   24-754   24-792   24-801   24-855   24-865   24-936
        24-983   24-993   24-:98   24-;21   24-?97   24-@12   24-@95   24-A60   24-B41   24-B85   24-C89
ERR4    15-277   15-283   15-293   15-299   15-406   15-412   15-570   15-602   15-608   15-618   15-624   15-659   15-665   15-865
        15-:72   15-:78   16-140#
ERR5    16-159#  24-913
ERR6    15-699   15-705   15-713   15-719   16-179#
ERR7    16-198#  24-<83   24-=26   24-=35   24-=47   24-=66   24-=74
ERR8    15-870   15-889   15-895   15-904   15-910   15-919   15-925   15-934   15-940   16-216#
ERR9    16-236#  24-551   24-565
ERRFLG  13-23#
ERROR1  13-40#   15-150*  15-163*  15-188*  15-214*  19-14*   24-546   24-560
EVL     12-20#
F$AU     7-18#   23-9     23-10
F$AUTO   7-18#   20-7     20-19
F$BGN    7-18#    7-24    16-100   16-106   16-121   16-140   16-159   16-179   16-198   16-216   16-236   17-9     18-8     19-8
        20-7     21-8     22-8     23-9     24-14    24-27    24-39    24-52    24-67    24-72    24-90    24-101   24-117   24-128
        24-150   24-166   24-186   24-203   24-227   24-232   24-247   24-279   24-286   24-298   24-303   24-320   24-332   24-337
        24-354   24-366   24-371   24-388   24-400   24-405   24-422   24-449   24-523   24-539   24-552   24-566   24-578   24-589
        24-594   24-610   24-638   24-648   24-655   24-676   24-680   24-695   24-710   24-727   24-731   24-746   24-760   24-774
        24-778   24-793   24-807   24-832   24-838   24-856   24-872   24-889   24-898   24-898   24-900   24-920   24-924   24-924
        24-938   24-939   24-957   24-960   24-960   24-984   24-994   24-999   24-:00   24-:22   24-:99   24-;22   24-;32   24-;52
        24-:81   24-<01   24-<27   24-<49   24-<87   24-=07   24-=76   24-=91   24->32   24->48   24-?12   24-?27   24-?47   24-?63
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        24-E87   24-F05   24-F55   24-F70   24-F87   24-G08   24-G40   24-G59   24-G90   24-H13   24-H60   25-14    26-13    26-37
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CROSS REFERENCE TABLE (CREF V01-05)

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        19-74   20-19   21-11   22-13   23-10   24-14   24-14   24-14   24-27   24-27   24-39   24-39   24-39   24-52
        24-52   24-67   24-67   24-67   24-86   24-90   24-90   24-101  24-101  24-101  24-117  24-117  24-128  24-128
        24-128  24-150  24-150  24-166  24-186  24-166  24-186  24-186  24-203  24-203  24-203  24-227  24-232  24-232
        24-247  24-247  24-247  24-279  24-286  24-286  24-298  24-298  24-298  24-316  24-320  24-320  24-332  24-332
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        24-422  24-422  24-449  24-449  24-449  24-523  24-523  24-539  24-539  24-539  24-552  24-566  24-578  24-589
        24-594  24-594  24-610  24-610  24-610  24-638  24-648  24-655  24-655  24-676  24-676  24-676  24-695  24-706
        24-710  24-710  24-727  24-727  24-727  24-746  24-756  24-760  24-760  24-774  24-774  24-774  24-793  24-803
        24-807  24-807  24-832  24-832  24-832  24-856  24-867  24-872  24-872  24-889  24-889  24-889  24-893  24-898
        24-915  24-920  24-920  24-924  24-924  24-938  24-938  24-939  24-939  24-957  24-957  24-957  24-960  24-960
        24-984  24-994  24-999  24-999  24-:00  24-:00  24-:22  24-:22  24-:22  24-:99  24-;22  24-;32  24-;32  24-;52
        24-;52  24-;52  24-;81  24-;81  24-<01  24-<01  24-<01  24-<27  24-<27  24-<49  24-<49  24-<49  24-<87  24-<87
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        24-A10  24-A10  24-A26  24-A26  24-A26  24-A73  24-A73  24-A89  24-A89  24-A89  24-B56  24-B56  24-B69  24-B69
        24-B69  24-B88  24-B88  24-C05  24-C05  24-C05  24-D34  24-D34  24-D58  24-D58  24-D58  24-E35  24-E35  24-E53
        24-E53  24-E53  24-E87  24-E87  24-F05  24-F05  24-F05  24-F55  24-F55  24-F70  24-F70  24-F70  24-F87  24-F87
        24-G08  24-G08  24-G08  24-G40  24-G40  24-G59  24-G59  24-G59  24-G90  24-G90  24-H13  24-H13  24-H13  24-H60
        24-H60  25-21   26-16   26-37
F$HARD   7-18#   25-14   25-21
F$HW     7-18#   10-9    10-23
F$INIT   7-18#   19-8    19-74
F$JMP    7-18#
F$MOD    7-18#    7-24    26-37
F$MSG    7-18#   16-100  16-102  16-106  16-115  16-121  16-134  16-140  16-153  16-159  16-173  16-179  16-192  16-198
        16-210  16-216  16-230  16-236  16-244
F$PROT   7-18#   18-8    18-12
F$PWR    7-18#
F$RPT    7-18#   17-9    17-11
F$SEG    7-18#   24-72   24-86   24-303  24-316  24-337  24-350  24-371  24-384  24-405  24-418  24-680  24-706  24-731
        24-756  24-778  24-803  24-838  24-867  24-900  24-915
F$SOFT   7-18#   26-13   26-16
F$SRV    7-18#
F$SUB    7-18#   24-898  24-920  24-924  24-938  24-960  24-999
F$SW     7-18#   11-8    11-11
F$TEST   7-18#   24-14   24-27   24-39   24-52   24-67   24-90   24-101  24-117  24-128  24-150  24-166  24-186  24-203
        24-232  24-247  24-286  24-298  24-320  24-332  24-354  24-366  24-388  24-400  24-422  24-449  24-523  24-539
        24-594  24-610  24-655  24-676  24-710  24-727  24-760  24-774  24-807  24-832  24-872  24-889  24-939  24-957
        24-:00  24-:22  24-;32  24-;52  24-;81  24-<01  24-<27  24-<49  24-<87  24-=07  24-=76  24-=91  24->32  24->48
        24-?12  24-?27  24-?47  24-?63  24-@27  24-@43  24-A10  24-A26  24-A73  24-A89  24-B56  24-B69  24-B88  24-C05
        24-D34  24-D58  24-E35  24-E53  24-E87  24-F05  24-F55  24-F70  24-F87  24-G08  24-G40  24-G59  24-G90  24-H13
        24-H60
FMT1     16-9#   16-101  16-107  16-122  16-142  16-160  16-181  16-199  16-218  16-237
FMT10    16-18#  16-141  16-180  16-217
FMT11    16-19#  16-161
FMT19    16-20#  24-456
FMT2     16-10#  16-108  16-123  16-143  16-162  16-182  16-200  16-219  16-238
FMT24    16-21#  24-482  24-501  24-520
FMT27    22-12   22-15#
FMT3     16-11#  16-110  16-125  16-164  16-221
FMT4     16-12#  16-111  16-126  16-130  16-145  16-149  16-165  16-169  16-184  16-188  16-202  16-206  16-222  16-226
        16-240
FMT5     16-13#  16-112  16-127  16-131  16-146  16-150  16-166  16-170  16-185  16-189  16-203  16-207  16-223  16-227
        16-241
FMT6     16-14#  16-114  16-129  16-133  16-148  16-152  16-168  16-172  16-187  16-191  16-205  16-209  16-225  16-229
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CROSS REFERENCE TABLE (CREF V01-05)

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FMT7    16-15#  16-109  16-144  16-201  16-220  16-239
FMT8    16-16#  16-124  16-163  16-183
FMT?    16-17#  16-113  16-128  16-132  16-147  16-151  16-167  16-171  16-186  16-190  16-204  16-208  16-224  16-228
        16-242
FRSTIM  13-37#  19-16   19-23*
G$CNTO   7-18#
G$DELM   7-18#
G$DISP   7-18#
G$EXCP   7-18#
G$HILI   7-18#
G$LOLI   7-18#
G$NO     7-18#
G$OFFS   7-18#  25-16   25-17   25-18   25-19
G$OFSI   7-18#  25-16   25-17   25-18   25-19
G$PRMA   7-18#  25-16   25-17
G$PRMD   7-18#  25-18   25-19
G$PRML   7-18#
G$RADA   7-18#
G$RADB   7-18#
G$RADD   7-18#
G$RADL   7-18#
G$RADO   7-18#  25-16   25-17   25-18   25-19
G$XFER   7-18#
G$YES    7-18#  25-16   25-17   25-18   25-19
GETALL  15-227#  15-275  15-281  15-291  15-297  15-404  15-410  15-568  15-600  15-606  15-616  15-622  15-657  15-663
        15-697   15-703  15-711  15-717  15-863  15-868  15-887  15-893  15-902  15-908  15-917  15-923  15-932  15-938
        15-:70   15-:76  24-575  24-586  24-635  24-645  24-692  24-702  24-743  24-752  24-790  24-799  24-853  24-863
        24-911   24-934  24-981  24-991  24-:96  24-;19  24-<81  24-=24  24-=33  24-=45  24-=64  24-=72  24-?95  24-@10
        24-@93   24-A58  24-B39  24-B83  24-C87
GETPRM  19-36    19-47#  19-54
GETREG  15-104#  15-233  24-48   24-82   24-113  24-146  24-182  24-224  24-276  24-312  24-346  24-380  24-414  24-478
        24-497   24-516  24-549  24-563
GOAH    12-60#
GOODAT  13-34#   15-855* 15-856* 15-877* 15-878* 16-110  16-125  16-164  16-221  24-45*  24-46*  24-80*  24-110* 24-111*
        24-143*  24-144* 24-179* 24-180* 24-221* 24-222* 24-273* 24-274* 24-310* 24-344* 24-378* 24-412* 24-476* 24-495*
        24-514*  24-572* 24-573* 24-583* 24-584* 24-632* 24-633* 24-642* 24-643* 24-690* 24-699* 24-700* 24-741* 24-750*
        24-788*  24-797* 24-850* 24-851* 24-860* 24-861* 24-908* 24-909* 24-931* 24-932* 24-978* 24-979* 24-988* 24-989*
        24-:94*  24-;17* 24-?93* 24-@08* 24-@18* 24-@91* 24-A56* 24-B37* 24-B81* 24-C85* 24-D05* 24-D21*
HDX     12-78#   12-148#
HELP     7-4#     8-9     8-19    9-10    14-24
HOE     12-20#
I$AU     7-18#   23-9#   23-10#
I$AUTO   7-18#   20-7#   20-19#
I$CLN    7-18#   21-8#   21-11#
I$DU     7-18#   22-8#   22-13#
I$HRD   25-14#   25-21#
I$INIT   7-18#   19-8#   19-74#
I$MOD    7-18#    7-24    7-24#  26-37   26-37#
I$MSG    7-18#   16-100# 16-102# 16-106# 16-115# 16-121# 16-134# 16-140# 16-153# 16-159# 16-173# 16-179# 16-192# 16-198#
        16-210#  16-216# 16-230# 16-236# 16-244#
I$PROT   7-18#   18-8#
I$PTAB   7-18#
I$PWR    7-18#
I$RPT    7-18#   17-9#   17-11#
I$SEG    7-18#   24-14   24-39   24-67   24-72#  24-86#  24-101  24-128  24-166  24-203  24-247  24-298  24-303# 24-316#
        24-332   24-337# 24-350# 24-366  24-371# 24-384# 24-400  24-405# 24-418# 24-449  24-539  24-610  24-676  24-680#
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CROSS REFERENCE TABLE (CREF V01-05)

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        24-889  24-898   24-900#  24-915#  24-924  24-957   24-960  24-:22   24-;52  24-<01   24-<49  24-=07   24-=91  24->48
        24-?27  24-?63   24-@43   24-A26   24-A89  24-B69   24-C05  24-D58   24-E53  24-F05   24-F70  24-G08   24-G59  24-H13
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I$SFT   26-13#  26-16#
I$SRV    7-18#
I$SUB    7-18#  24-14    24-39    24-67    24-101  24-128   24-166  24-203   24-247  24-298   24-332  24-366   24-400  24-449
        24-539  24-610   24-676   24-727   24-774  24-832   24-889  24-898   24-898# 24-920   24-920# 24-920#  24-924  24-924#
        24-938  24-938#  24-938#  24-957   24-960  24-960#  24-984  24-994   24-999  24-999#  24-999# 24-:22   24-;52  24-<01
        24-<49  24-=07   24-=91   24->48   24-?27  24-?63   24-@43  24-A26   24-A89  24-B69   24-C05  24-D58   24-E53  24-F05
        24-F70  24-G08   24-G59   24-H13
I$TST    7-18#  24-14    24-14#   24-27    24-27#  24-27#   24-39   24-39#   24-52   24-52#   24-52#  24-67    24-67#  24-90
        24-90#  24-90#   24-101   24-101#  24-117  24-117#  24-117# 24-128   24-128# 24-150   24-150# 24-150#  24-166  24-166#
        24-186  24-186#  24-186#  24-203   24-203# 24-227   24-232  24-232#  24-232# 24-247   24-247# 24-279   24-286  24-286#
        24-286# 24-298   24-298#  24-320   24-320# 24-320#  24-332  24-332#  24-354  24-354#  24-354# 24-366   24-366# 24-388
        24-388# 24-388#  24-400   24-400#  24-422  24-422#  24-422# 24-449   24-449# 24-523   24-523# 24-523#  24-539  24-539#
        24-552  24-566   24-578   24-589   24-594  24-594#  24-594# 24-610   24-610# 24-638   24-648  24-655   24-655# 24-655#
        24-676  24-676#  24-710   24-710#  24-710# 24-727   24-727# 24-760   24-760# 24-760#  24-774  24-774#  24-807  24-807#
        24-807# 24-832   24-832#  24-872   24-872# 24-872#  24-889  24-889#  24-898  24-924   24-939  24-939#  24-939# 24-957
        24-957# 24-960   24-:00   24-:00#  24-:00# 24-:22   24-:22# 24-:99   24-;22  24-;32   24-;32# 24-;32#  24-;52  24-;52#
        24-;81  24-;81#  24-;81#  24-<01   24-<01# 24-<27   24-<27# 24-<27#  24-<49  24-<49#  24-<87  24-<87#  24-<87# 24-=07
        24-=07# 24-=76   24-=76#  24-=76#  24-=91  24-=91#  24->32  24->32#  24->32# 24->48   24->48# 24-?12   24-?12# 24-?12#
        24-?27  24-?27#  24-?47   24-?47#  24-?47# 24-?63   24-?63# 24-@27   24-@27# 24-@27#  24-@43  24-@43#  24-A10  24-A10#
        24-A10# 24-A26   24-A26#  24-A73   24-A73# 24-A73#  24-A89  24-A89#  24-B56  24-B56#  24-B56# 24-B69   24-B69# 24-B88
        24-B88# 24-B88#  24-C05   24-C05#  24-D34  24-D34#  24-D34# 24-D58   24-D58# 24-E35   24-E35# 24-E35#  24-E53  24-E53#
        24-E87  24-E87#  24-E87#  24-F05   24-F05# 24-F55   24-F55# 24-F55#  24-F70  24-F70#  24-F87  24-F87#  24-F87# 24-G08
        24-G08# 24-G40   24-G40#  24-G40#  24-G59  24-G59#  24-G90  24-G90#  24-G90# 24-G90#  24-H13  24-H13#  24-H60  24-H60#  24-H60#
I422    12-251# 12-259
IACT    12-134# 15-655   15-661
IACTIV  15-645# 15-772   15-793   24-?83   24-?88  24-@03   24-@16  24-@24   24-@63  24-@72   24-@79  24-@84   24-A01  24-A07
        24-A46  24-A51   24-A66   24-A70   24-B09  24-B18   24-B25  24-B30   24-B47  24-B53   24-C51  24-C76   24-C97  24-D13
IBE     12-20#
IC      12-68#  12-133#  24-A05   24-A68   24-B51
ICIR    12-173# 15-614   15-620
IDL     12-243#
IDLE    12-99#  24-=55   24-=95   24-E57   24-F74  24-G63
IDU     12-20#
IER     12-20#
IERR    12-103# 15-817   15-823   24-?68   24-@48  24-A31   24-A94  24-C13
INITRN  15-436# 24-;54   24-<03   24-<51   24-=12  24-=53   24-=93  24->50   24-?28  24-C07   24-D70  24-E55   24-F07  24-F72
        24-G10  24-G61   24-H17
INTFLG  13-21#
INTGRL  12-255# 12-259
IRDY    12-136# 15-598   15-604   15-783
ISIRDY  15-588# 15-774   15-787   15-791   15-795  15-:33   15-:39  24-C63   24-C72  24-C80   24-C93  24-D01   24-D09  24-D17
        24-D64  24-D89   24-D99   24-E08   24-E20
ISR     12-20#
ISRUN   25-19   25-26#
IXE     12-20#
J$JMP    7-18#
L$ACP    8-17#
L$APT    8-17#
L$AU     8-17   23-9#
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CROSS REFERENCE TABLE (CREF V01-05)

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L$DTP    8-17#
L$DTYP   8-17#
L$DU     8-17    22-8#
L$DUT    8-17#
L$DVTY   8-17    14-12#
L$EF     8-17#
L$ENVI   8-17#
L$ETP    8-17#
L$EXP1   8-17#
L$EXP4   8-17#
L$EXP5   8-17#
L$HARD   8-17    25-14    25-14#
L$HIME   8-17#
L$HPCP   8-17#
L$HPTP   8-17#
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L$LOAD   8-17#
L$LUN    8-17#
L$MREV   8-17#
L$NAME   8-17#
L$PRIO   8-17#
L$PROT   8-17    18-8#
L$PRT    8-17#
L$REPP   8-17#
L$REV    8-17#
L$RPT   17-9#
L$SOFT  26-13    26-13#
L$SPC    8-17#
L$SPCP   8-17#
L$SPTP   8-17#
L$STA    8-17#
L$SW    11-8     11-8#
L$TEST   8-17#
L$TIML   8-17#
L$UNIT   8-17#   19-49
L10000  10-9     10-23#
L10001  11-8     11-11#
L10002  16-102#
L10003  16-115#
L10004  16-134#
L10005  16-153#
L10006  16-173#
L10007  16-192#
L10010  16-210#
L10011  16-230#
L10012  16-244#
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CROSS REFERENCE TABLE (CREF V01-05)

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L10023  24-52#
L10024  24-90#
L10025  24-117#
L10026  24-150#
L10027  24-186#
L10030  24-227   24-232#
L10031  24-279   24-286#
L10032  24-320#
L10033  24-354#
L10034  24-388#
L10035  24-422#
L10036  24-523#
L10037  24-552   24-566   24-578   24-589   24-594#
L10040  24-638   24-648   24-655#
L10041  24-710#
L10042  24-760#
L10043  24-807#
L10044  24-872#
L10045  24-939#
L10046  24-920#
L10047  24-938#
L10050  24-:00#
L10051  24-984   24-994   24-999#
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L10053  24-;81#
L10054  24-<27#
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L10057  24->32#
L10060  24-?12#
L10061  24-?47#
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L10063  24-A10#
L10064  24-A73#
L10065  24-B56#
L10066  24-B88#
L10067  24-D34#
L10070  24-E35#
L10071  24-E87#
L10072  24-F55#
L10073  24-F87#
L10074  24-G40#
L10075  24-G90#
L10076  24-H60#
L10077  25-14    25-21#
L10100  26-13    26-16#
LDMSG1  15-;02#
LDTXSI  15-343#  15-456  15-457  15-515  15-:06  24-:34  24-:35  24-:59  24-;07  24-=38  24-?34  24-?77  24-@57  24-A40
        24-B03   24-B76   24-D75   24-D97   24-E27   24-E31   24-E60   24-F12   24-F76   24-G17   24-G18   24-G66   24-H22   24-H29
        24-H30
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CROSS REFERENCE TABLE (CREF V01-05)

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LODMSG  15-999#  15-;04   24-G13   24-H25
LOE     12-20#
LOGDEV  13-17#   19-42*   19-48*   19-49    19-51    20-16    22-12
LOOPIN  15-130#  24-463
LOT     12-20#
LU1MOD   7-24#
LULOOP  12-39#   15-39    15-234   15-372   15-465   24-834
LULP    12-70#   12-135#  24-?73   24-@53   24-A36   24-A99   24-C21
LUR10   12-301#  15-106   16-112   16-127   16-146   16-166   16-185   16-203   16-223   16-241
LUR11   12-302#  16-112   16-127   16-14E   16-166   16-185   16-203   16-223   16-241
LUR12   12-303#  16-112   16-127   16-146   16-166   16-185   16-203   16-223   16-241
LUR13   12-304#  16-112   16-127   16-146   16-166   16-185   16-203   16-223   16-241
LUR14   12-305#  16-114   16-129   16-148   16-168   16-187   16-205   16-225   16-243
LUR15   12-306#  16-114   16-129   16-148   16-168   16-187   16-205   16-225   16-243
LUR16   12-307#  16-114   16-129   16-148   16-168   16-187   16-205   16-225   16-243
LUR17   12-308#  16-114   16-129   16-148   16-168   16-187   16-205   16-225   16-243
LUREG   12-301   12-302   12-303   12-304   12-305   12-306   12-307   12-308   12-309   12-310   12-311   12-312   12-313   12-514
        12-315   12-316   13-11#
LUSWI1  13-62#
LUSWI2  13-63#
LUSWI3  13-64#
MA  1   12-79#
MAINT2  12-80#
MCLK    12-175#  24-471   24-476   24-491   24-510   24-514
MCLR    12-37#   15-33    15-34
MODR    12-149#
MPCSR   13-53#   16-101   16-107   16-122   16-142   16-160   16-181   16-199   16-218   16-237   19-58*   20-12    24-19
MPIVEC  13-59#   19-67*
MPOVEC  13-60#   19-68*   19-69*
MPRIOR  13-61#   19-70*
MSG1    13-461#  15-;05   15-;07   15-;10   24-?31   24-?35   24-?44   24-?75   24-?78   24-?87   24-@01   24-@55   24-@58   24-@69
        24-@70   24-@77   24-@99   24-A38   24-A41   24-A50   24-A64   24-B01   24-B04   24-B15   24-B16   24-B23   24-B45   24-C23
        24-G14
MSG4    13-473#  24-H26
MSTCLR  15-30#   15-441   24-41    24-68    24-102   24-?06   24-129   24-167   24-204   24-212   24-248   24-299   24-333   24-367
        24-401   24-450   24-522   24-540   24-556   24-611   24-677   24-728   24-775   24-833   24-890   24-927   24-961   24-:27
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        24-B70   24-B87   24-C10   24-D33   24-D63   24-E34   24-E86   24-F54   24-F86   24-G39   24-G89   24-H59
MVIOX   12-334#  15-65    24-461
MVIXO   12-335#  15-87
MVIXOX  12-336#  24-171
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CROSS REFERENCE TABLE (CREF V01-05)

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PATB    13-146#  24-88    24-258
PATC    13-157#  24-301
PATCH   26-28#
PATD    13-163#  24-318   24-335
PATE    13-169#  24-352   24-369
PATF    13-178#  24-386   24-403
PATG    13-184#  24-206   24-420
PATH    13-195#  24-210   24-542
PATI    13-206#  24-554   24-558   24-612   24-697   24-700   24-929   24-932
PATJ    13-217#  24-592   24-615   24-619   24-620
PATK    13-228#  24-678   24-776
PATL    13-302#  24-708   24-729   24-805
PATM    13-311#  24-43    24-46    24-108   24-111   24-141   24-144   24-177   24-180   24-214   24-250   24-758
PATN    13-322#  24-230   24-958
PATO    13-339#  24-891   24-996
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PATV    13-413#  24-835   24-870
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POLL    12-75#
PRI     12-20#
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PRI01   12-20#
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PRI03   12-20#
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PRI07   12-20#   20-9     20-11    24-16    24-18
PRIOR   13-19#
PRIRTY  25-18    25-25#
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R14NRW  13-109#  24-74    24-77
RAB     12-138#  15-913   15-915   15-921
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        24-D19
RAX16   13-29#   15-171*  15-172*  15-240   15-695   15-701   15-709   15-715   24-581   24-585   24-640   24-644   24-697   24-701
        24-748   24-751   24-795   24-798   24-858   24-862   24-904   24-910   24-929   24-933   24-986   24-990
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CROSS REFERENCE TABLE (CREF V01-05)

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        15-:74  24-43   24-47   24-77*  24-78   24-81   24-108  24-112  24-140* 24-141  24-145  24-177  24-181  24-218*
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        24-379  24-409* 24-410  24-413  24-470* 24-471  24-477  24-490* 24-491  24-496  24-509* 24-510  24-515  24-:47
        24-:79  24-<79  24-=22  24-=31  24-=43  24-=62  24-=70
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REG2    13-81#
REG3    13-82#
REG4    13-83#
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        15-345* 15-348* 15-351* 15-392  15-398* 15-413* 15-419* 15-437  15-452* 15-464* 15-478* 15-490* 15-553  15-556*
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        15-745* 15-763  15-766* 15-798* 15-814  15-815* 15-826* 15-843  15-859* 15-867* 15-873* 15-948* 15-953* 15-968
        15-973* 15-985* 15-:57  15-:62* 15-:89* 16-109  16-144  16-161  16-201  16-220  16-239  24-40*  24-69*  24-103*
        24-130* 24-168* 24-169  24-205* 24-209* 24-213* 24-228* 24-256* 24-257* 24-263* 24-264* 24-267  24-300* 24-334*
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ROMI    12-41#  15-16   15-18   15-19   15-131  15-133
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RSEOM   15-685#  15-776  24-@65  24-@74  24-@81  24-@86  24-A03  24-B11  24-B20  24-B27  24-B32  24-B49  24-C53  24-C78
        24-C99  24-D15
RSOM    12-200#  15-695  15-701
RTS     12-147#  15-566  24-<79
RUN     12-36#  15-34   15-133  24-134
RUNINH  13-66#  19-72*  24-452
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RX1     12-115#  12-187#
RX2     12-114#  12-186#
RX3     12-113#  12-185#
RX4     12-112#  12-184#
RX5     12-111#  12-183#
RX6     12-110#  12-182#
RX7     12-109#  12-181#
RXABT   12-291#
RXBCC   12-293#  15-;12
RXCHAR  15-:25#  24-E76  24-E80  24-E82  24-E84  24-F22  24-F26  24-F30  24-F34  24-F38  24-F42  24-F46  24-F50  24-F52
RXEBL   12-292#
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RXLEN1  12-268#  15-849  24-E70  24-E74  24-F24  24-F28  24-F40  24-F44
RXLEN2  12-267#  15-849  24-E66  24-E70  24-E74  24-F24  24-F28  24-F32  24-F36
RXOVR   12-290#
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        15-921  15-930  15-936
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CROSS REFERENCE TABLE (CREF V01-05 )


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SAVE4    13-38#    19-18*    19-21     20-17     24-25
SAVE6    13-39#    19-19*    19-22     20-18     24-26
SAVLEN   13-45#    15-45*    15-849    15-982*   19-15*
SCRACH   13-16#
SEC      12-242#
SECA     12-100#
SEL4     13-57#    19-63*    19-64*
SEL6     13-58#    15-17*    15-132*   19-65*    19-66*
SELFR    12-77#
SELSBY   12-81#
SETUP    15-967#   24-?66    24-@46    24-A29    24-A92    24-C11
SFPTBL   11-8#
SIGQ     12-170#
SIGR     12-169#
SOM      12-63#
STALL    15-330#   15-374    15-376    15-467    15-472    15-485
STARES   13-50#    19-38*    19-43*    24-454
STARST   19-26     19-29     19-37#
STBY     12-151#
STEPLU   12-38#    15-373    15-375    15-466    15-471    15-484
STEPMP   12-42#    15-18     15-19
STPCLK   15-15#    15-67     15-91     24-174
STPERR   15-814#
STPLU    15-364#   15-532    15-778    15-821    15-945    15-:35    15-:63    24-:44    24-:76    24-;12    24-<75    24-=18    24-=28    24-=40
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CROSS REFERENCE TABLE (CREF V01-05)

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CROSS REFERENCE TABLE (CREF V01-05)

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CROSS REFERENCE TABLE (CREF V01-05)

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          24-G08   24-G08#  24-G59   24-G59   24-G59#  24-H13   24-H13   24-H13#  25-14    25-14    25-14#   26-13    26-13    26-13#
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           9-8      9-8      9-8      9-8      9-8      9-8      9-8      9-8      9-8      9-8      9-8      9-8      9-8      9-8
           9-8      9-8      9-8      9-8      9-8      9-8      9-8      9-8      9-8      9-8      9-8      9-8      9-8      9-8
           9-8      9-8      9-8      9-8      9-8      9-8      9-8      9-8      9-8      9-8      9-8      9-8      9-8      9-8
           9-8      9-8      9-8      9-8      9-8      9-8      9-8      9-8      9-8      9-8      9-8      9-8      9-8      9-8
           9-8      9-8      9-8      9-8      9-8      9-8      9-8      9-8      9-8      9-8      9-8      9-8      9-8      9-8
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          16-173#  16-192   16-192#  16-210   16-210#  16-230   16-230#  16-244   16-244#  17-11    17-11#   18-12    18-12#   19-74
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          25 18    25-18    25-18#   25-18#   25-18#   25-19    25-19    25-19    25-19#   25-19#   25-19#   25-21    25-21#   26-16
          26-16#   26-37    26-37#
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          24-539#  24-610   24-610   24-610#  24-676   24-676   24-676#  24-727   24-727   24-727#  24-774   24-774   24-774#  24-832
          24-832   24-832#  24-889   24-889   24-889#  24-898   24-924   24-957   24-957   24-957#  24-960   24-:22   24-:22   24-:22#
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          24-=91#  24->48   24->48   24->48#  24-.27   24-?27   24-?27#  24-?63   24-?63   24-?63#  24-@43   24-@43   24-@43#  24-A26
          24-A26   24-A26#  24-A89   24-A89   24-A89#  24-B69   24-B69   24-B69#  24-C05   24-C05   24-C05#  24-D58   24-D58   24-D58#
          24-E53   24-E53   24-E53#  24-F05   24-F05   24-F05#  24-F70   24-F70   24-F70#  24-G08   24-G08   24-G08#  24-G59   24-G59
          24-G59#  24-H13   24-H13   24-H13#  26-39
T$TSTM     7-18#   15-277   15-283   15-293   15-299   15-406   15-412   15-570   15-602   15-608   15-618   15-624   15-659   15-665
          15-699   15-705   15-713   15-719   15-865   15-870   15-889   15-895   15-904   15-910   15-919   15-925   15-934   15-940
          15-:72   15-:78   16-101   16-102   16-107   16-108   16-109   16-110   16-111   16-112   16-113   16-114   16-115   16-122
          16-123   16-124   16-125   16-126   16-127   16-128   16-129   16-130   16-131   16-132   16-133   16-134   16-141   16-142
          16-143   16-144   16-145   16-146   16-147   16-148   16-149   16-150   16-151   16-152   16-153   16-160   16-161   16-162
          16-163   16-164   16-165   16-166   16-167   16-168   16-169   16-170   16-171   16-172   16-173   16-180   16-181   16-182
          16-183   16-184   16-185   16-186   16-187   16-188   16-189   16-190   16-191   16-192   16-199   16-200   16-201   16-202
          16-203   16-204   16-205   16-206   16-207   16-208   16-209   16-210   16-217   16-218   16-219   16-220   16-221   16-222
          16-223   16-224   16-225   16-226   16-227   16-228   16-229   16-230   16-237   16-238   16-239   16-240   16-241   16-242
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CROSS REFERENCE TABLE (CREF V01-05)

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	24-320	24-337	24-348	24-350	24-354	24-371	24-382	24-384	24-388	24-405	24-416	24-418	24-422	24-456
	24-480	24-482	24-499	24-501	24-518	24-520	24-523	24-551	24-552	24-565	24-566	24-577	24-578	24-588
	24-589	24-594	24-637	24-638	24-647	24-648	24-655	24-680	24-694	24-695	24-704	24-706	24-710	24-731
	24-745	24-746	24-754	24-756	24-760	24-778	24-792	24-793	24-801	24-803	24-807	24-838	24-855	24-856
	24-865	24-867	24-872	24-898	24-900	24-913	24-915	24-920	24-924	24-936	24-938	24-939	24-960	24-983
	24-984	24-993	24-994	24-999	24-:00	24-:98	24-:99	24-;21	24-;22	24-;32	24-;81	24-<2/	24-<83	24-<87
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	24-A60	24-A73	24-B41	24-B56	24-B85	24-B88	24-C89	24-D34	24-E35	24-E87	24-F55	24-F87	24-G40	24-G90
	24-H60													
T$TSTS	7-18#	24-14#	24-39#	24-67#	24-101#	24-128#	24-166#	24-203#	24-247#	24-298#	24-332#	24-366#	24-400#	24-449#
	24-539#	24-610#	24-676#	24-727#	24-774#	24-832#	24-889#	24-957#	24-:22#	24-;52#	24-<01#	24-<49#	24-=07#	24-=91#
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	24-H13#													
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T11	9-8	24-366#												
T12	9-8	24-400#												
T13	9-8	24-449#												
T14	9-8	24-539#												
T15	9-8	24-610#												
T16	9-8	24-676#												
T17	9-8	24-727#												
T18	9-8	24-774#												
T19	9-8	24-832#												
T2	9-8	24-39#												
T20	9-8	24-889#												
T20.1	24-898#													
T20.2	24-924#													
T21	9-8	24-957#												
T21.1	24-960#													
T22	9-8	24-:22#												
T23	9-8	24-;52#												
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T31	9-8	24-@43#												
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T39	9-8	24-F70#												
T4	9-8	24-101#												
T40	9-8	24-G08#												
T41	9-8	24-G59#												
T42	9-8	24-H13#												
T5	9-8	24-128#												
T6	9-8	24-166#												

CROSS REFERENCE TABLE (CREF V01-05)

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T7        9-8      24-203#
T8        9-8      24-247#
T9        9-8      24-298#
TECM     12-220#   24-C45    24-C68
TERR     12-217#
TEST     12-258#   24-844
TESTMD   12-174#
TIMFLG   13-24#
TMP0     13-89#    15-229*   15-232*   16-124    16-163    16-183
TMP1     13-90#    15-247*   15-248*   16-124    16-163    16-183
TMP2     13-91#
TMP3     13-92#
TMP4     13-93#
TMP5     13-94#
TMP6     13-95#
TMP7     13-96#
TSOM     12-221#
TSTCON   13-65#
TSTNUM   13-49#    24-451*   24-456
TX0      12-54#    12-212#
TX1      12-53#    12-211#
TX2      12-52#    12-210#
TX3      12-51#    12-209#
TX4      12-50#    12-208#
TX5      12-49#    12-207#
TX6      12-48#    12-206#
TX7      12-47#    12-205#
TXAB     12-219#
TXABT    12-279#
TXCHAR   15-510#   24-;57    24-;60    24-;63    24-;66    24-;69    24-;72    24-;75    24-<06    24-<09    24-<12    24-<15    24-<18    24-<21
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         24-?07
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TXEN     12-86#    12-158#   24-140    24-<55    24-C17    24-C19
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         24-<19    24-<22    24-<64    24-<67    24-<70    24-<73    24->19    24->22    24->25    24->28    24-?02    24-?05    24-?08    24-E30
         24-G16    24-H28
TXGA     12-218#
TXGOA    12-278#   24-G16
TXLEN0   12-266#   15-849    24-=98    24->11    24->64    24->74    24->84    24->94
TXLEN1   12-265#   15-849    24->06    24->11    24->69    24->74    24->89    24->94
TXLEN2   12-264#   15-849    24-=98    24->06    24->11    24->79    24->84    24->89    24->94
TXSOM    12-281#   13-461    13-462    15-448    24-:33    24-=37    24-H20
TXWORD   13-41#    15-344*   15-346    15-349    15-448*   15-449*   15-514*   15-:05*   24-:33*   24-:58*   24-;06*   24-=37*   24-?33*   24-?76*
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         24-H28*
UAM      12-20#
UNIT     13-48#
UNRR     12-128#   15-861    24-=22    24-=31    24-=43    24-=62    24-=70
UPBITS   13-99#    24-215    24-260    24-?66    24-307    24-341    24-375    24-409
V35      12-254#   12-259
VECTOR   25-17     25-24#
WAITSO   15-316#   15-458    15-516    15-559    15-780    15-:09    15-:29    24-971    24-:36    24-:60    24-=39    24-?37    24-?80    24-@60
         24-A43    24-B06    24-D29    24-E63    24-F15    24-G19    24-G69    24-H31
WAX      12-89#    12-161#   15-205
WAX15    13-30#    15-195*   15-196    15-447*   15-449    15-970*   15-979*   24-543*   24-619*   24-621    24-682*   24-684*   24-688    24-690
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CROSS REFERENCE TABLE (CREF V01-05)

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        24-C67*  24-E65*  24-F17*
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        24-748   24-750   24-781*  24-783*  24-795   24-797   24-841*  24-=98*  24->06*  24->11*  24->16*  24->64*  24->69*  24->74*
        24->79*  24->84*  24->89*  24->94*  24->99*  24-C28*  24-C40*  24-C45*  24-C68*  24-E66*  24-E70*  24-E74*  24-E78*  24-F20*
        24-F24*  24-F28*  24-F32*  24-F36*  24-F40*  24-F44*  24-F48*
WRDYTO  12-342#  15-188   15-214   24-546
WRIBYT  13-27#   15-41*   15-89*   15-90    15-152*  15-153*  15-154*  15-155*  15-190*  15-191*  15-192*  15-196*  15-200*  15-203*
        15-204*  15-205*  15-206*  15-346*  15-349*  15-454*  15-557*  15-816*  15-817*  15-823*  15-975*  24-73*   24-74*   24-78
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        24-378   24-406*  24-410   24-412   24-901*  24-925*  24-965*  24-968*  24-<55*  24-?73*  24-@53*  24-A05*  24-A36*  24-A68*
        24-A99*  24-B51*  24-B72*  24-C17*  24-C21*  24-D24*  24-D27*  24-G82*
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        24->65   24->70   24->75   24->80   24->85   24->90   24->95   24-?00   24-C29   24-C48   24-C69   24-E67   24-E71   24-E75
        24-E79   24-F21   24-F25   24-F29   24-F33   24-F37   24-F41   24-F45   24-F49
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        24-<56   24-?74   24-@54   24-A06   24-A37   24-A69   24-B00   24-B52   24-B73   24-C18   24-C22   24-D25   24-D28   24-G83
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XSFALS   7-18#
XSOFFS   7-18#
XSTRUE   7-18#
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CROSS REFERENCE TABLE (CREF V01-05)

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BGNCLN   1-39#    7-18#    21-8
BGNDU    1-47#    7-18#    22-8
BGNHRD   1-55#    7-18#    25-14
BGNHW    1-66#    7-18#    10-9
BGNINI   1-77#    7-18#    19-8
BGNMOD   1-85#    7-18#     7-24
BGNMSG   1-98#    7-18#    16-100   16-106   16-121   16-140   16-159   16-179   16-198   16-216   16-236
BGNPRO   1-106#   7-18#    18-8
BGNPTA   1-114#   7-18#
BGNRPT   1-144#   7-18#    17-9
BGNSEG   1-152#   7-18#    24-72    24-303   24-337   24-371   24-405   24-680   24-731   24-778   24-838   24-900
BGNSET   1-161#   7-18#
BGNSFT   1-182#   7-18#    26-13
BGNSRV   1-193#   7-18#
BGNSUB   1-201#   7-18#    24-89?   24-924   24-960
BGNSW    1-225#   7-18#    11-8
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        24-G59   24-H13
BNCOMP   1-266#   7-18#
BNERRO   1-270#   7-18#
BREAK    1-274#   7-18#
BRESET   1-278#   7-18#    22-10    24-133
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CLOCK    1-286#   7-18#
CLOSE    1-292#   7-18#
CLRVEC   1-296#   7-18#
COMMEN   1-301#   7-18#
DELAY    1-322#   7-18#
DESCRI   1-317#   7-18#    14-17
DEVTYP   1-341#   7-18#    14-12
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DISPLA   1-360#   7-18#
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DODU     1-380#   7-18#    20-16
DORPT    1-385#   7-18#
ENDAU    1-389#   7-18#    23-10
ENDAUT   1-401#   7-18#    20-19
ENDCLN   1-413#   7-18#    21-11
ENDCOM   1-425#   7-18#
ENDDU    1-441#   7-18#    22-13
ENDHRD   1-453#   7-18#    25-21
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ENDMOD   1-48?#   7-18#    26-37
ENDMSG   1-500#   7-18#    16-102   16-115   16-134   16-153   16-173   16-192   16-210   16-230   16-244
ENDPRO   1-512#   7-18#    18-12
ENDPTA   1-520#   7-18#
ENDRPT   1-529#   7-18#    17-11
ENDSEG   1-541#   7-18#    24-86    24-316   24-350   24-384   24-418   24-706   24-756   24-803   24-867   24-915
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ENDSW    1-614#  7-18#  11-11
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ERRTBL   1-734#  7-18#
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IOSTAR   1-974#  7-18#
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CROSS REFERENCE TABLE (CREF V01-05)

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        24-E35  24-E35#  24-E87  24-E87#  24-F55  24-F55#  24-F87  24-F87#  24-G40  24-G40#  24-G90  24-G90#  24-H60  24-H60#
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CROSS REFERENCE TABLE (CREF V01-05)

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	24-G90#	24-H60#												
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	24-638#	24-647	24-647#	24-647#	24-648	24-648#	24-655	24-655#	24-680	24-680#	24-694	24-694#	24-694#	24-695
	24-695#	24-704	24-704#	24-704#	24-706	24-706#	24-710	24-710#	24-731	24-731#	24-745	24-745#	24-745#	24-746
	24-746#	24-754	24-754#	24-754#	24-756	24-756#	24-760	24-760#	24-778	24-778#	24-792	24-792#	24-792#	24-793
	24-793#	24-801	24-801#	24-801#	24-803	24-803#	24-807	24-807#	24-838	24-838#	24-855	24-855#	24-855#	24-856
	24-856#	24-865	24-865#	24-865#	24-867	24-867#	24-872	24-872#	24-898	24-898#	24-900	24-900#	24-913	24-913#
	24-913#	24-915	24-915#	24-920	24-920#	24-924	24-924#	24-936	24-936#	24-936#	24-938	24-938#	24-939	24-939#
	24-960	24-960#	24-983	24-983#	24-983#	24-984	24-984#	24-993	24-993#	24-993#	24-994	24-994#	24-999	24-999#
	24-:00	24-:00#	24-:98	24-:98#	24-:98#	24-:99	24-:99#	24-;21	24-;21#	24-;21#	24-;22	24-;22#	24-;32	24-;32#
	24-;81	24-;81#	24-<27	24-<27#	24-<83	24-<83#	24-<83#	24-<87	24-<87#	24-=26	24-=26#	24-=26#	24-=35	24-=35#
	24-=35#	24-=47	24-=47#	24-=47#	24-=66	24-=66#	24-=66#	24-=74	24-=74#	24-=74#	24-=76	24-=76#	24->32	24->32#
	24-?12	24-?12#	24-?47	24-?47#	24-?97	24-?97#	24-?97#	24-@12	24-@12#	24-@12#	24-@27	24-@27#	24-@95	24-@95#
	24-@95#	24-A10	24-A10#	24-A60	24-A60#	24-A60#	24-A73	24-A73#	24-B41	24-B41#	24-B41#	24-B56	24-B56#	24-B85
	24-B85#	24-B85#	24-B88	24-B88#	24-C89	24-C89#	24-C89#	24-D34	24-D34#	24-E35	24-E35#	24-E87	24-E87#	24-F55
	24-F55#	24-F87	24-F87#	24-G40	24-G40#	24-G90	24-G90#	24-H60	24-H60#					
MSWORD	1-C94#	7-18#	8-17	8-17#	9-8	9-8	9-8	9-8	9-8	9-8	9-8	9-8	9-8	9-8
	9-8	9-8	9-8	9-8	9-8	9-8	9-8	9-8	9-8	9-8	9-8	9-8	9-8	9-8
	9-8	9-8	9-8	9-8	9-8	9-8	9-8	9-8	9-8	9-8	9-8	9-8	9-8	9-8
	9-8	9-8	9-8	9-8	9-8	9-8#	15-277	15-277	15-277	15-277#	15-283	15-283	15-283	15-283#
	15-293	15-293	15-293	15-293#	15-299	15-299	15-299	15-299#	15-406	15-406	15-406	15-406#	15-412	15-412
	15-412	15-412#	15-570	15-570	15-570	15-570#	15-602	15-602	15-602	15-602#	15-608	15-608	15-608	15-608#
	15-618	15-618	15-618	15-618#	15-624	15-624	15-624	15-624#	15-659	15-659	15-659	15-659#	15-665	15-665
	15-665	15-665#	15-699	15-699	15-699	15-699#	15-705	15-705	15-705	15-705#	15-713	15-713	15-713	15-713#
	15-719	15-719	15-719	15-719#	15-865	15-865	15-865	15-865#	15-870	15-870	15-870	15-870#	15-889	15-889
	15-889	15-889#	15-895	15-895	15-895	15-895#	15-904	15-904	15-904	15-904#	15-910	15-910	15-910	15-910#
	15-919	15-919	15-919	15-919#	15-925	15-925	15-925	15-925#	15-934	15-934	15-934	15-934#	15-940	15-940
	15-940	15-940#	15-:72	15-:72	15-:72	15-:72#	15-:78	15-:78	15-:78	15-:78#	24-24	24-24	24-24	24-24#
	24-50	24-50	24-50	24-50#	24-84	24-84	24-84	24-84#	24-115	24-115	24-115	24-115#	24-148	24-148
	24-148	24-148#	24-184	24-184	24-184	24-184#	24-226	24-226	24-226	24-226#	24-278	24-278	24-278	24-278#
	24-314	24-314	24-314	24-314#	24-348	24-348	24-348	24-348#	24-382	24-382	24-382	24-382#	24-416	24-416
	24-416	24-416#	24-480	24-480	24-480	24-480#	24-499	24-499	24-499	24-499#	24-518	24-518	24-518	24-518#
	24-551	24-551	24-551	24-551#	24-565	24-565	24-565	24-565#	24-577	24-577	24-577	24-577#	24-588	24-588
	24-588	24-588#	24-637	24-637	24-637	24-637#	24-647	24-647	24-647	24-647#	24-694	24-694	24-694	24-694#

CROSS REFERENCE TABLE (CREF V01-05)

	24-704	24-704	24-704	24-704#	24-745	24-745	24-745	24-745#	24-754	24-754	24-754	24-754#	24-792	24-792
	24-792	24-792#	24-801	24-801	24-801	24-801#	24-855	24-855	24-855	24-855#	24-865	24-865	24-865	24-865#
	24-913	24-913	24-913	24-913#	24-936	24-936	24-936	24-936#	24-983	24-983	24-983	24-983#	24-993	24-993
	24-993	24-993#	24-:98	24-:98	24-:98	24-:98#	24-;21	24-;21	24-;21	24-;21#	24-<83	24-<83	24-<83	24-<83#
	24-=26	24-=26	24-=26	24-=26#	24-=35	24-=35	24-=35	24-=35#	24-=47	24-=47	24-=47	24-=47#	24-=66	24-=66
	24-=66	24-=66#	24-=74	24-=74	24-=74	24-=74#	24-?97	24-?97	24-?97	24-?97#	24-a12	24-a12	24-a12	24-a12#
	24-a95	24-a95	24-a95	24-a95#	24-A60	24-A60	24-A60	24-A60#	24-B41	24-B41	24-B41	24-B41#	24-B85	24-B85
	24-B85	24-B85#	24-C89	24-C89	24-C89	24-C89#	25-16	25-16#	25-17	25-17#	25-18	25-18#	25-19	25-19#
	26-39	26-39												
MSXFER	1-a82#	7-18#												
MANUAL	1-;62#	7-18#												
MEMORY	1-;66#	7-18#												
OPEN	1-;71#	7-18#												
POINTE	1-;76#	7-18#	8-7											
PRINTB	1-<39#	7-18#	16-101	16-107	16-108	16-109	16-110	16-122	16-123	16-124	16-125	16-141	16-142	16-143
	16-144	16-160	16-161	16-162	16-163	16-164	16-180	16-181	16-182	16-183	16-199	16-200	16-201	16-217
	16-218	16-219	16-220	16-221	16-237	16-238	16-239							
PRINTF	1-<79#	7-18#	22-12	24-456	24-482	24-501	24-520							
PRINTS	1-=19#	7-18#												
PRINTX	1-=59#	7-18#	16-111	16-112	16-113	16-114	16-126	16-127	16-128	16-129	16-130	16-131	16-132	16-133
	16-145	16-146	16-147	16-148	16-149	16-150	16-151	16-152	16-165	16-166	16-167	16-168	16-169	16-170
	16-171	16-172	16-184	16-185	16-186	16-187	16-188	16-189	16-190	16-191	16-202	16-203	16-204	16-205
	16-206	16-207	16-208	16-209	16-222	16-223	16-224	16-225	16-226	16-227	16-228	16-229	16-240	16-241
	16-242	16-243												
READBU	1-=99#	7-18#												
READEF	1->03#	7-18#	19-25	19-28	19-31	19-34								
RFLAGS	1->08#	7-18#												
SETPRI	1->13#	7-18#	20-9	24-16										
SETVEC	1->18#	7-18#												
SLASH	1->24#	7-18#												
STARS	1->38#	7-18#												
SVC	1->52#	7-17#	7-18											
XFER	1-a12#	7-18#												
XFERF	1-a16#	7-18#												
XFERT	1-a20#	7-18#												