M8203,LUNT

M8203 STATIC DIAG. #1

CZDMRA0

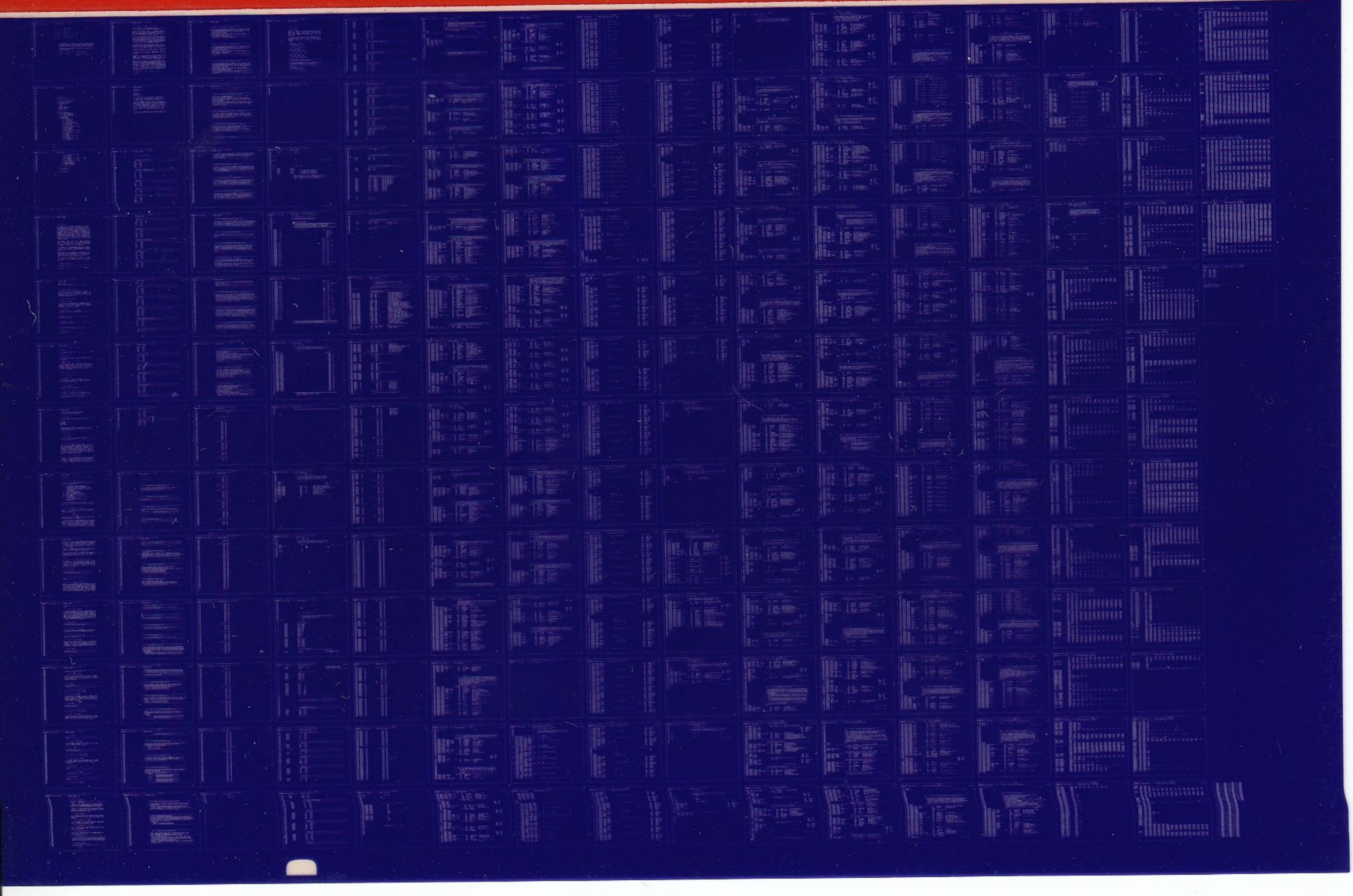
AH-E232A-MC

FICHE 1 OF 1

SEP 1979

digital

MADE IN USA



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3299                    .REM @
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3301                                IDENTIFICATION
3302                                --------------
3303
3304                    PRODUCT CODE:   AC-E231A-MC
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3306                    PRODUCT NAME:   CZDMRA0 M8203 STATIC DIAG #1
3307
3308                    PRODUCT DATE:   JUNE 1979
3309
3310                    MAINTAINER:     DIAGNOSTIC ENGINEERING
3311
3312                    AUTHOR:         DAVID HOFFMAN
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3332                        DEC             DECUS           DECTAPE
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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, AND WHICH IS CURRENTLY EMPLOYED IN THE DMP-11 DDCMP MULTIDROP PROJECT. 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>

```
3579                                    D) ANSWER HARDWARE AND SOFTWARE QUESTIONS
3580                                    E) GET END OF PASS MESSAGES OR ERROR MESSAGES
3581                                    F) TO END EXECUTION, ENTER CONTROL/C
3582
3583
3584                                    6.2 INITIAL DIALOGUE
3585
3586                                    AFTER THE PROGRAM AND THE SUPERVISOR ARE LOADED AND THE PROGRAM
3587                                    IS STARTED, THE FOLLOWING IDENTIFICATION IS TYPED :
3588
3589                                    DRS LOADED
3590                                    DIAG. RUN-TIME SERVICES
3591                                    CZDMR-A-0
3592                                    M8203 STATIC LOGIC TESTS - PART 1 OF 2
3593                                    UNIT IS M8203
3594                                    DR>
3595
3596                                    THE OPERATOR THEN PROCEEDS BY TYPING ONE OR MORE OF THE
3597                                    COMMANDS DESCRIBED IN THE FOLLOWING SECTION 6.3. (FOR MORE
3598                                    DETAILED INFORMATION, REFER TO THE DIAGNOSTIC SUPERVISOR
3599                                    FUNCTIONAL SPECIFICATION).
3600
3601
3602                                    6.3 PROGRAM OPTIONS
3603
3604
3605                                    6.3.1 START COMMAND
3606
3607                                    ************************************************************
3608                                    STA(RT)/TESTS:<TEST-LIST>/PASS:<PASS-CNT>/FLAGS:
3609                                       <FLAG-LIST>/EOP:<INCR>
3610                                    ************************************************************
3611
3612
3613                                    6.3.1.1 TESTS SWITCH (/TESTS:<TEST-LIST>)
3614
3615                                    <TEST-LIST>  IS  A SEQUENCE OF DECIMAL NUMBERS (1:2 ETC.) OR
3616                                    RANGES OF DECIMAL NUMBERS (1-5:8-10 ETC.) THAT  SPECIFY  THE
3617                                    TESTS  TO BE EXECUTED.  THE NUMBERS ARE SEPARATED BY COLONS.
3618                                    THE NUMBERS RANGE FROM 1 TO THE LARGEST TEST NUMBER  IN  THE
3619                                    DIAGNOSTIC.  THEY MAY BE SPECIFIED IN ANY ORDER.  TESTS WILL
3620                                    BE EXECUTED IN NUMERICAL ORDER REGARDLESS OF  THE  ORDER  OF
3621                                    SPECIFICATION.   THE  DEFAULT  IS  TO EXECUTE ALL TESTS.  ON
3622                                    THIS AND ALL SWITCHES, THE ANGLE BRACKETS <> ARE PUNCTUATION
3623                                    USED  IN THE DEFINITION ONLY, AND ARE NOT TO BE TYPED BY THE
3624                                    OPERATOR.  SEE EXAMPLE AT END OF 6.3.1.5.
3625
3626
3627                                    6.3.1.2 PASS SWITCH (/PASS:<PASS-CNT>)
3628
3629                                    <PASS-CNT> IS A DECIMAL NUMBER INDICATING THE DESIRED NUMBER
3630                                    OF  PASSES.   A PASS IS DEFINED AS THE EXECUTION OF THE FULL
3631                                    DIAGNOSTIC (ALL SELECTED TESTS) AGAINST ALL UNITS SUBMITTED.
3632                                    THE DEFAULT IS NON-ENDING EXECUTION.  IN THIS CASE EXIT FROM
3633                                    THE PROGRAM IS ACCOMPLISHED EITHER BY TYPING A CONTROL/C  OR
3634                                    BY  OCCURANCE  OF AN ERROR WITH THE HALT ON ERROR FLAG BEING
```

SET. THE EXIT IS A RETURN TO COMMAND MODE. SEE EXAMPLE AT END OF 6.3.1.5.

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

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

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

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

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

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

6.3.1.5 EFFECT OF START COMMAND

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

THE HARDWARE PARAMETER DIALOGUE COMMENCES WITH THE QUESTION "# UNITS?" TO WHICH THE OPERATOR REPLIES WITH A DECIMAL NUMBER N FROM 1 TO 16. THE TERM "UNIT" REFERS TO THE DEVICE TO WHICH THIS SERIES OF DIAGNOSTICS IS DEDICATED. FOLLOWING THIS ARE THE QUESTIONS WHEREBY THE P-TABLES THEMSELVES WILL BE BUILT. EACH P-TABLE IS A CORE-RESIDENT TABLE CONTAINING ALL THE HARDWARE INFORMATION FOR ONE UNIT. THE OPERATOR MUST SUPPLY N (NUMBER OF UNITS) VALUES FOR EACH QUESTION.

HE MAY DO THIS BY GIVING ONE ANSWER TO EACH QUESTION (IN WHICH CASE THE SERIES OF QUESTIONS WILL BE POSED N TIMES) OR BY GIVING N VALUES, SEPARATED BY COMMAS, TO EACH QUESTION (SERIES WILL BE POSED ONCE). EACH QUESTION IS FOLLOWED BY THE RESPONSE RADIX (D FOR DECIMAL, B FOR BINARY, O FOR OCTAL, L FOR YES/NO) IN PARENTHESES AND THE DEFAULT VALUE AFTER THE PARENTHESES.

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

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

EXAMPLE:

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

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

6.3.2 RESTART COMMAND

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

6.3.2.1 TESTS, PASS, AND FLAGS SWITCHES

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

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

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

IS TO TEST ALL UNITS WHICH HAVE NOT BEEN DROPPED BY A DROP COMMAND.

6.3.2.3 EFFECT OF RESTART COMMAND

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

6.3.3 CONTINUE COMMAND

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

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

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

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

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

6.3.3.3 EFFECT OF CONTINUE COMMAND

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

6.3.4 PROCEED COMMAND

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

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

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

6.3.4.2 EFFECT OF PROCEED COMMAND

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

6.3.5 ADD COMMAND

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

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

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

6.3.5.2 EFFECT OF ADD COMMAND

THE UNITS SPECIFIED ARE ADDED TO THE TEST SEQUENCE. EACH UNIT MUST HAVE A P-TABLE IN MEMORY DUE TO AN EARLIER HARDWARE DIALOGUE. THIS COMMAND MUST BE FOLLOWED BY A RESTART OR CONTINUE. THE UNITS SWITCH MUST BE SPECIFIED. THE ADD COMMAND IS MEANINGFUL ONLY FOR UNITS THAT WERE PREVIOUSLY DROPPED.

6.3.6 DROP COMMAND

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

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

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

6.3.6.2 EFFECT OF DROP COMMAND

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

6.3.7 PRINT COMMAND

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

6.3.7.1 EFFECT OF PRINT COMMAND

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

6.3.8 DISPLAY COMMAND

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

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

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

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 (SEL0) 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. MICROPROCESSOR RUN SWITCH - 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).
```

```
4057
4058
4059                            7.0 DEVICE INFORMATION TABLES
4060
4061
4062
4063                            ;*****************************************************************************
4064                            * MAINTENANCE REGISTER - BSEL1
4065                            ;*****************************************************************************
4066                            RUN     = BIT7
4067                            MCLR    = BIT6
4068                            STEPLU  = BIT4
4069                            LULOOP  = BIT3
4070                            ROMO    = BIT2
4071                            ROMI    = BIT1
4072                            STEPMP  = BIT0
4073
4074                            ;*****************************************************************************
4075                            * OBUS REG 10 - TRANSMITTER BUFFER
4076                            ;*****************************************************************************
4077                            TX7     = BIT7
4078                            TX6     = BIT6
4079                            TX5     = BIT5
4080                            TX4     = BIT4
4081                            TX3     = BIT3
4082                            TX2     = BIT2
4083                            TX1     = BIT1
4084                            TX0     = BIT0
4085
4086                            ;*****************************************************************************
4087                            * OBUS REG 11
4088                            ;*****************************************************************************
4089                            OC      = BIT7
4090                            GOAH    = BIT3
4091                            ABORT   = BIT2
4092                            EOM     = BIT1
4093                            SOM     = BIT0
4094
4095                            ;*****************************************************************************
4096                            * OBUS REG 12
4097                            ;*****************************************************************************
4098                            IC      = BIT7
4099                            BPOLL   = BIT6
4100                            LULP    = BIT5
4101
4102                            ;*****************************************************************************
4103                            * OBUS REG 13
4104                            ;*****************************************************************************
4105                            POLL    = BIT7
4106                            DTR     = BIT6
4107                            SELFR   = BIT5
4108                            HDX     = BIT4
4109                            MAINT1  = BIT3
4110                            MAINT2  = BIT2
4111                            SELSBY  = BIT1
4112
```

```
4113                    ;*****************************************************************************
4114                    * OBUS REG 14
4115                    ;*****************************************************************************
4116                    TXEN    = BIT6
4117                    DISSI   = BIT5
4118                    RDAX    = BIT4
4119                    WAX     = BIT3
4120                    ENAX    = BIT2
4121                    AX2     = BIT1
4122                    AX1     = BIT0
4123
4124                    ;*****************************************************************************
4125                    * OBUS REG 17
4126                    ;*****************************************************************************
4127                    CRC2    = BIT7
4128                    CRC1    = BIT6
4129                    IDLE    = BIT5
4130                    SECA    = BIT4
4131                    STRIP   = BIT3
4132                    RDALL   = BIT2
4133                    IERR    = BIT1
4134                    DDCMP   = BIT0
4135
4136                    ;*****************************************************************************
4137                    * IBUS REG 10 - RECEIVER BUFFER
4138                    ;*****************************************************************************
4139                    RX7     = BIT7
4140                    RX6     = BIT6
4141                    RX5     = BIT5
4142                    RX4     = BIT4
4143                    RX3     = BIT3
4144                    RX2     = BIT2
4145                    RX1     = BIT1
4146                    RX0     = BIT0
4147
4148                    ;*****************************************************************************
4149                    * IBUS REG 11
4150                    ;*****************************************************************************
4151                    OC      = BIT7
4152                    OACT    = BIT6
4153                    SW3     = BIT5
4154                    ORDY    = BIT4
4155                    SW2     = BIT3
4156                    SW1     = BIT2
4157                    SW0     = BIT1
4158                    UNRR    = BIT0
4159
4160                    ;*****************************************************************************
4161                    * IBUS REG 12
4162                    ;*****************************************************************************
4163                    IC      = BIT7
4164                    IACT    = BIT6
4165                    LULP    = BIT5
4166                    IRDY    = BIT4
4167                    OVRR    = BIT3
4168                    RAB     = BIT2
```

```
4169                            EBLK    = BIT1
4170                            BCC     = BIT0
4171
4172                            ;*****************************************************************************
4173                            * IBUS REG 13
4174                            ;*****************************************************************************
4175                            RING    = BIT7
4176                            DTR     = BIT6
4177                            RTS     = BIT5
4178                            HDX     = BIT4
4179                            MODR    = BIT3
4180                            CS      = BIT2
4181                            STBY    = BIT1
4182                            CARR    = BIT0
4183
4184                            ;*****************************************************************************
4185                            * IBUS REG 14
4186                            ;*****************************************************************************
4187                            READY   = BIT7
4188                            TXEN    = BIT6
4189                            DISSI   = BIT5
4190                            RDAX    = BIT4
4191                            WAX     = BIT3
4192                            ENAX    = BIT2
4193                            AX2     = BIT1
4194                            AX1     = BIT0
4195
4196                            ;*****************************************************************************
4197                            * IBUS REG 17
4198                            ;*****************************************************************************
4199                            SIGR    = BIT7
4200                            SIGQ    = BIT6
4201                            TXDATA  = BIT5
4202                            OCOR    = BIT4
4203                            ICIR    = BIT3
4204                            TESTMD  = BIT2
4205                            MCLK  = BIT1
4206                            DDCMP   = BIT0
4207
4208                            ;*****************************************************************************
4209                            * AX0-15 - USYRT REG 0 (READ ONLY)
4210                            ;*****************************************************************************
4211                            RX7     = BIT7
4212                            RX6     = BIT6
4213                            RX5     = BIT5
4214                            RX4     = BIT4
4215                            RX3     = BIT3
4216                            RX2     = BIT2
4217                            RX1     = BIT1
4218                            RX0     = BIT0
4219
4220                            ;*****************************************************************************
4221                            * AX0-16 - USYRT REG 1 (READ ONLY)
4222                            ;*****************************************************************************
4223                            RERR    = BIT7
4224                            ASBC2   = BIT6
```

```
4225                            ASBC1   = BIT5
4226                            ASBC0   = BIT4
4227                            ROR     = BIT3
4228                            RABT    = BIT2
4229                            REOM    = BIT1
4230                            RSOM    = BIT0
4231
4232                            ;*****************************************************************************
4233                            * AX1-15 - USYRT REG 2
4234                            ;*****************************************************************************
4235                            TX7     = BIT7
4236                            TX6     = BIT6
4237                            TX5     = BIT5
4238                            TX4     = BIT4
4239                            TX3     = BIT3
4240                            TX2     = BIT2
4241                            TX1     = BIT1
4242                            TX0     = BIT0
4243
4244                            ;*****************************************************************************
4245                            * AX1-16 - USYRT REG 3
4246                            ;*****************************************************************************
4247                            TERR    = BIT7
4248                            TXGA    = BIT3
4249                            TXAB    = BIT2
4250                            TEOM    = BIT1
4251                            TSOM    = BIT0
4252
4253                            ;*****************************************************************************
4254                            * AX2-15 - USYRT REG 4
4255                            ;*****************************************************************************
4256                            SYN7    = BIT7
4257                            SYN6    = BIT6
4258                            SYN5    = BIT5
4259                            SYN4    = BIT4
4260                            SYN3    = BIT3
4261                            SYN2    = BIT2
4262                            SYN1    = BIT1
4263                            SYN0    = BIT0
4264                            SYNCH   = 226
4265
4266                            ;*****************************************************************************
4267                            * AX2-16 - USYRT REG 5
4268                            ;*****************************************************************************
4269                            APA     = BIT7
4270                            DDC     = BIT6
4271                            STR     = BIT5
4272                            SEC     = BIT4
4273                            IDL     = BIT3
4274                            CRCTY2  = BIT2
4275                            CRCTY1  = BIT1
4276                            CRCTY0  = BIT0
4277
4278                            ;*****************************************************************************
4279                            * AX3-15 - USYRT REG 6
4280                            ;*****************************************************************************
```

```
4281                            I422    = BIT7
4282                            XYZ     = BIT6
4283                            V35     = BIT4
4284                            INTGRL  = BIT3
4285                            OP      = BIT1
4286                            TEST    = BIT0
4287                            AX315U  = I422!XYZ!V35!INTGRL!OP
4288
4289                            ;*****************************************************************************
4290                            * AX3-16 - USYRT REG 7
4291                            ;*****************************************************************************
4292                            TXLEN2  = BIT7
4293                            TXLEN1  = BIT6
4294                            TXLEN0  = BIT5
4295                            RXLEN2  = BIT2
4296                            RXLEN1  = BIT1
4297                            RXLEN0  = BIT0
4298
4299
4300
4301
4302
```

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

```
4416                    ;*****************************************************************************
4417                        TEST 9 - REG 11 READ/WRITE BIT TEST
4418                    *
4419                    * WRITE, READ, AND COMPARE EACH WORD OF DATA PATTERN C INTO REG 11 :
4420                    *     DATA PATTERN C = 020,020,020.
4421                    ;*****************************************************************************
4422
4423
4424
4425
4426
4427                    ;*****************************************************************************
4428                        TEST 10 - REG 12 READ/WRITE BIT TEST
4429                    *
4430                    * WRITE, READ, AND COMPARE EACH WORD OF DATA PATTERN D INTO REG 12 :
4431                    *     DATA PATTERN D = 000,040,000.
4432                    ;*****************************************************************************
4433
4434
4435
4436
4437
4438                    ;*****************************************************************************
4439                        TEST 11 - REG 13 READ/WRITE BIT TEST
4440                    *
4441                    * WRITE, READ, AND COMPARE EACH WORD OF DATA PATTERN E INTO REG 13 :
4442                    *     DATA PATTERN E = 000,120,020,100,120,000.
4443                    ;*****************************************************************************
4444
4445
4446
4447
4448
4449                    ;*****************************************************************************
4450                        TEST 12 - REG 17 READ/WRITE BIT TEST
4451                    *
4452                    * WRITE, READ, AND COMPARE EACH WORD OF DATA PATTERN F INTO REG 17 :
4453                    *     DATA PATTERN F = 050,051,050.
4454                    ;*****************************************************************************
4455
4456
4457
4458
4459
4460                    ;*****************************************************************************
4461                        TEST 13 - MAINTENANCE CLOCK BIT TEST
4462                    *
4463                    * FIRST, A MASTER CLEAR IS ISSUED TO INIT ALL REGS. THEN, THE MICROPROCESSOR
4464                    * IS PLACED IN A LOOP ON AN INSTRUCTION, BY SETTING THE INSTRUCTION IN SEL6
4465                    * AND SETTING ROMI AND RUN IN BSEL1. THE INSTRUCTION IS ONE WHICH REPETITIVELY
4466                    * READS LINE UNIT REG 17 INTO BSEL2. THE PDP-11 CAN THEN SCAN BSEL2 TO MONITOR
4467                    * THE MAINTENANCE CLOCK BIT, MCLK. THE FOLLOWING SEQUENCE IS THEN PERFORMED
4468                    * TO MONITOR MCLK :
4469                    * - THE PROGRAM REPEATEDLY CHECKS THE MCLK BIT FOR THE 1 STATE, AND IF IT IS
4470                    *   NOT FOUND WITHIN SEVERAL HUNDRED MILLI-SEC (DEPENDING ON THE PROCESSOR)
4471                    *   AN ERROR IS REPORTED. (THE MAINTENANCE CLOCK HAS A PERIOD OF 41.6 MICRO-
```

```
4472                            *   SEC).
4473                            * - THE PROGRAM NEXT REPEATEDLY CHECKS THE MCLK BIT FOR THE 0 STATE, AND IF
4474                            *   IT IS NOT FOUND WITHIN SEVERAL HUNDRED MILLI-SEC AN ERROR IS REPORTED.
4475                            * - THE PROGRAM NEXT REPEATEDLY CHECKS MCLK BIT FOR THE 1 STATE AGAIN, AND
4476                            *   IF IT IS NOT FOUND WITHIN SEVERAL HUNDRED MILLI-SEC, AN ERROR IS REPORTED.
4477                            *
4478                            * IF THE P-TABLE FOR THIS UNIT INDICATES THAT THE MICROPROCESSOR RUN SWITCH
4479                            * IS OFF, THE TEST WILL BE SKIPPED.
4480                            ;*****************************************************************************
4481
4482
4483
4484
4485
4486                            ;*****************************************************************************
4487                                TEST 14 - EXTENDED REGISTER MASTER CLEAR TEST
4488                            *
4489                            * FIRST, ALL READ/WRITE BITS OF EXTENDED REGS AX0-AX3 ARE SET BY LOADING
4490                            * A DIFFERENT WORD OF PATTERN H INTO EACH REG. THEN, A MASTER CLEAR IS
4491                            * ISSUED AND EACH REG IS READ AND COMPARED TO A WORD OF PATTERN I, WHICH
4492                            * CONTAINS THE INITIALIZED STATES OF ALL THE EXTENDED REGS.
4493                            *    PATTERN H = 000,000,377,017,377,377,375,377
4494                            *    PATTERN I = 000,000,000,000,000,103,000,000
4495                            ;*****************************************************************************
4496
4497
4498
4499
4500
4501                            ;*****************************************************************************
4502                                TEST 15 - EXTENDED REGISTER ADDRESSING TEST
4503                            *
4504                            * FIRST, ISSUE A MASTER CLEAR TO PUT REGS INTO INITIALIZED STATES SHOWN IN
4505                            * PATTERN I. THEN, WRITE A DIFFERENT WORD OF PATTERN J INTO EACH EXTENDED (AX)
4506                            * REG, AND AFTER EACH WRITE, READ AND COMPARE ALL EXTENDED REGS TO EXPECTED
4507                            * VALUES.
4508                            *   PATTERN I = 000,000,000,000,000,103,000,000
4509                            *   PATTERN J = 000,000,001,002,004,103,040,100
4510                            ;*****************************************************************************
4511
4512
4513
4514
4515
4516                            ;*****************************************************************************
4517                                TEST 16 - REGS 15,16 / AX2-15,AX2-16 READ/WRITE BIT TEST
4518                            *
4519                            * USING REGS 15,16, THE INDIRECT REGS AX2-15,AX2-16 (USYRT REGS 4,5) ARE
4520                            * WRITTEN AND READ USING EACH WORD OF PATTERN K. AX2-15 IS COMPARED
4521                            * TO THE WORD WRITTEN, AND AX2-16 IS ALWAYS COMPARED TO 103. (AX2-16 IS NOT
4522                            * WRITEABLE).
4523                            *    PATTERN K =
4524                            *      FOR REG 15: 000,377,125,252,001,002,004,010,020,040,100,200,000,000,
4525                            *                  000,000,000,000,000,000,376,375,373,367,357,337,277,177,
4526                            *                  377,377,377,377,377,377,377,377
4527                            *      FOR REG 16: 000,377,125,252,000,000,000,000,000,000,000,000,001,002,
```

```
4528                            *                   004,010,020,040,100,200,377,377,377,377,377,377,377,377,
4529                            *                   376,375,373,367,357,337,277,177.
4530                            ;*****************************************************************************
4531
4532
4533
4534
4535
4536                            ;*****************************************************************************
4537                                TEST 17 - AX0-15,AX0-16 READ/WRITE BIT TEST
4538                            *
4539                            * IN THIS TEST, A MASTER CLEAR IS DONE, AND THEN A WRITE, READ, AND COMPARE
4540                            * ARE PERFORMED IN REGS AX0-15,AX0-16 USING EACH WORD OF PATTERN L.
4541                            * ANY BITS IN AX0-15,AX0-16 WHICH ARE NOT READ/WRITE ARE MASKED OFF (TO 0)
4542                            * IN THE EXPECTED VALUE BEFORE COMPARISON.
4543                            *    PATTERN L =
4544                            *       FOR REG 15: 000,377,000
4545                            *       FOR REG 16: 000,377,000.
4546                            ;*****************************************************************************
4547
4548
4549
4550
4551
4552                            ;*****************************************************************************
4553                                TEST 18 - AX1-15,AX1-16 READ/WRITE BIT TEST
4554                            *
4555                            * IN THIS TEST, A MASTER CLEAR IS DONE, AND THEN Å WRITE, READ, AND COMPARE
4556                            * ARE PERFORMED IN REGS AX1-15,AX1-16 USING EACH WORD OF PATTERN K.
4557                            * ANY BITS IN AX1-15,AX1-16 WHICH ARE NOT READ/WRITE ARE MASKED OFF (TO 0)
4558                            * IN THE EXPECTED VALUE BEFORE COMPARISON.
4559                            ;*****************************************************************************
4560
4561
4562
4563
4564
4565                            ;*****************************************************************************
4566                                TEST 19 - AX3-15,AX3-16 READ/WRITE BIT TEST
4567                            *
4568                            * IN THIS TEST A MASTER CLEAR IS DONE AND THEN A WRITE, READ, AND COMPARE ARE
4569                            * PERFORMED IN REGS AX3-15,AX3-16 USING EACH WORD OF PATTERN V FOR WRITING,
4570                            * AND PATTERN U FOR COMPARING.
4571                            * ANY BITS IN AX3-15,AX3-16 WHICH ARE NOT READ/WRITE ARE MASKED OFF (TO 0)
4572                            * IN THE EXPECTED VALUE BEFORE COMPARISON.
4573                            *   PATTERN V =
4574                            *       FOR REG 15 : 000,333,331,323,313,233,133,000,000,000,000,
4575                            *                    000,000,000,000,000,000,000,000
4576                            *       FOR REG 16 : 000,000,000,000,000,000,000,001,002,004,040,
4577                            *                    100,200,346,345,343,307,247,147
4578                            *   PATTERN U =
4579                            *       FOR REG 15 : 000,001,013,011,021,101,301,000,000,000,000,
4580                            *                    000,000,000,000,000,000,000,000
4581                            *       FOR REG 16 : 000,000,000,000,000,000,000,001,002,004,040,
4582                            *                    100,200,346,345,343,307,247,147
4583                            ;*****************************************************************************
```

```
4584
4585
4586
4587
4588
4589                    ;*****************************************************************************
4590                        TEST 20 - REG 17 - AX2-16 READ/WRITE, MASTER CLEAR TEST
4591                    *
4592                    * THIS TEST CONSISTS OF 2 SUBTESTS. IN THE FIRST SUBTEST, EACH BYTE OF PAT O
4593                    * IS WRITTEN INTO REG 17 AND AFTER EACH WRITE, AX2-16 IS READ AND COMPARED
4594                    * TO A BYTE OF PAT P.
4595                    *   PATTERN O = 000,041,004,010,020,040,100,101,200,201,300,111,301,375
4596                    *   PATTERN P = 000,113,200,040,020,010,001,104,007,105,007,144,107,157
4597                    * IN THE SECOND SUBTEST, REG 17 IS LOADED WITH 375, A MASTER CLEAR IS ISSUED,
4598                    * AND AX2-16 IS COMPARED TO ITS INITIALIZED STATE (103).
4599                    ;*****************************************************************************
4600
4601
4602
4603
4604
4605                    ;*****************************************************************************
4606                        TEST 21 - TRANSMITTER BUFFER DATA TEST
4607                    * A MASTER CLEAR IS DONE FIRST, AND THEN A BYTE OF PATTERN N IS LOADED INTO
4608                    * REG 11 AND THE NEXT BYTE IS LOADED TWICE INTO REG 10. THE PROGRAM THEN WAITS
4609                    * AT LEAST 50 MICRO-SEC, AND THEN IT READS AND COMPARES AX1-15 TO THE BYTE WHICH
4610                    * WAS LOADED INTO REG 10, AND IT READS AND COMPARES AX1-16 TO THE BYTE WHICH WAS
4611                    * LOADED INTO REG 11. THIS PROCESS IS REPEATED (INCLUDING THE MASTER CLEAR)
4612                    * FOR EACH PAIR OF BYTES IN PATTERN N.
4613                    *   PATTERN N =
4614                    *     FOR REG 10: 000,125,252,377,000,000,000
4615                    *     FOR REG 11: 000,000,000,000,005,012,017
4616                    ;*****************************************************************************
4617
4618
4619
4620
4621
4622                    ;*****************************************************************************
4623                        TEST 22 - TRANSMITTER BUFFER SEQUENCING TEST
4624                    *
4625                    * FIRST, A MASTER CLEAR IS DONE, AND THE PROGRAM CHECKS FOR ORDY=1, OCOR=0.
4626                    * THEN, 2 TSOM CHARS ARE LOADED INTO THE TX SILO, AND ALLOWED TO RIPPLE
4627                    * DOWN TO THE OUTPUT. THE PROGRAM CHECKS FOR ORDY=1, OCOR=1.
4628                    * NEXT, THE PROGRAM CYCLES THE STEPLU BIT UNTIL OCOR=0 AGAIN, AND CHECKS FOR
4629                    * THIS TO OCCUR WITHIN 3 CYCLES.
4630                    * THE SILO IS THEN FILLED WITH 64 BYTES OF A 256-BYTE BINARY COUNT PATTERN
4631                    * (000-377) AND THE PROGRAM CHECKS FOR ORDY=0 AFTER THE 64TH CHAR IS LOADED.
4632                    * THE PROGRAM CYCLES STEPLU FOR 8 CYCLES AND CHECKS THAT AFTER THE 8TH, ORDY=1.
4633                    * AX1-15 IS READ AND COMPARED TO EXPECTED DATA.
4634                    * THE REST OF THE BINARY COUNT DATA BYTES ARE LOADED, CYCLED 8 CLOCKS, READ AND
4635                    * COMPARED, A BYTE AT A TIME. UPON COMPLETION, THE SILO IS CHECKED TO BE EMPTY
4636                    * WITH ORDY=1, OCOR=0.
4637                    ;*****************************************************************************
4638
4639
```

```
4640
4641
4642
4643                    ;*****************************************************************************
4644                        TEST 23 - TX MSG TIMING TEST, CHAR MODE, WITH CRC
4645                    *
4646                    * IN THIS TEST, AN ENTIRE MESSAGE IS TRANSMITTED (USING STEPLU AND LULOOP)
4647                    * AND THE PROGRAM MONITORS THE OCCURRENCE OF USYRT TX BUFFER EMPTY FLAGS
4648                    * (BY SCANNING ORDY AND OCOR) AND OACT, AT EACH STEP. THE TEST IS DONE IN
4649                    * CHARACTER ORIENTED PROTOCOL MODE, USING 8-BIT CHARS AND CRC-16.
4650                    * THE FOLLOWING STEPS ARE DONE:
4651                    * A MASTER CLEAR IS DONE, AND THE LINE UNIT IS PLACED IN CHAR MODE.
4652                    * SOM IS SET TWICE TO SEND 2 SYNCH CHARS. THEN, 2 000 CHARS ARE SENT, AND
4653                    * THEN 2 TERMINATING SYNCHS ARE SENT.
4654                    * THE TRANSMITTER IS THEN DISABLED, USING OC, AND OACT IS MONITORED FOR THE
4655                    * CLEARED STATE AFTER THE 3RD SYNCH COMPLETES.
4656                    ;*****************************************************************************
4657
4658
4659
4660
4661
4662                    ;*****************************************************************************
4663                        TEST 24 - TX MSG TIMING TEST, BIT MODE, WITH CRC
4664                    *
4665                    * IN THIS TEST, AN ENTIRE MESSAGE IS TRANSMITTED (USING STEPLU AND LULOOP)
4666                    * AND THE PROGRAM MONITORS THE OCCURRENCE OF USYRT TX BUFFER EMPTY FLAGS
4667                    * (BY SCANNING ORDY AND OCOR) AND OACT, AT EACH STEP. THE TEST IS DONE IN
4668                    * BIT ORIENTED PROTOCOL MODE, USING 8-BIT CHARS AND CRC-CCITT-1.
4669                    * THE FOLLOWING STEPS ARE DONE:
4670                    * A MASTER CLEAR IS DONE, AND THE LINE UNIT IS PLACED IN BIT MODE.
4671                    * SOM IS SET TWICE TO SEND 2 FLAG CHARS. THEN, 2 000 CHARS ARE SENT, AND
4672                    * THEN 2 TERMINATING FLAGS ARE SENT.
4673                    * THE TRANSMITTER IS THEN DISABLED, USING OC, AND OACT IS MONITORED FOR THE
4674                    * CLEARED STATE.
4675                    ;*****************************************************************************
4676
4677
4678
4679
4680
4681                    ;*****************************************************************************
4682                        TEST 25 - TX MSG TIMING TEST, CHAR MODE, WITH NO CRC
4683                    *
4684                    * IN THIS TEST, AN ENTIRE MESSAGE IS TRANSMITTED (USING STEPLU AND LULOOP)
4685                    * AND THE PROGRAM MONITORS THE OCCURRENCE OF USYRT TX BUFFER EMPTY FLAGS
4686                    * (BY SCANNING ORDY AND OCOR) AND OACT, AT EACH STEP. THE TEST IS DONE IN
4687                    * CHARACTER ORIENTED PROTOCOL MODE, USING 8-BIT CHARS AND NO ERROR CHECKING.
4688                    * THE FOLLOWING STEPS ARE DONE:
4689                    * A MASTER CLEAR IS DONE, AND THE LINE UNIT IS PLACED IN CHAR MODE.
4690                    * SOM IS SET TWICE TO SEND 2 SYNCH CHARS. THEN, 2 000 CHARS ARE SENT, AND
4691                    * THEN 2 TERMINATING SYNCHS ARE SENT.
4692                    * THE TEST IS PERFORMED WITH TXEN (REG 14, BIT6) SET, AND THE PROGRAM CHECKS
4693                    * THAT THIS HOLDS RTS HIGH PAST THE END OF THE MESSAGE.
4694                    * THE TRANSMITTER IS THEN DISABLED, USING OC, AND OACT IS MONITORED FOR THE
4695                    * CLEARED STATE.
```

```
4696                    ;*****************************************************************************
4697
4698
4699
4700
4701
4702                    ;*****************************************************************************
4703                        TEST 26 - TX UNDERRUN SET AND CLEAR TEST - CHAR MODE
4704                    *
4705                    * IN THIS TEST, A TX UNDERRUN ERROR IS FORCED IN EACH OF 2 SITUATIONS,
4706                    * AND THEN CLEARED DIFFERENTLY IN EACH.
4707                    * IN THE FIRST, A MESSAGE IS INITIATED, A 000 CHAR IS SENT, AND THE TX
4708                    * BUFFER IS NOT SERVICED IN RESPONSE TO THE USYRT TX BUFFER EMPTY FLAG,
4709                    * WHICH CAUSES UNRR TO SET IN REG 11. THEN, SOM IS SET TO CLEAR THE ERROR,
4710                    * AND THIS IS VERIFIED.
4711                    * IN THE SECOND SITUATION, A MSG IS INITIATED, A 000 CHAR IS SENT, AND THE TX
4712                    * BUFFER IS NOT SERVICED IN RESPONSE TO THE USYRT TX BUFFER EMPTY FLAG, WHICH
4713                    * AGAIN CAUSES UNRR TO SET. THEN, A MASTER CLEAR IS DONE, AND THE UNRR BIT
4714                    * IS CHECKED TO BE CLEARED.
4715                    ;*****************************************************************************
4716
4717
4718
4719
4720
4721                    ;*****************************************************************************
4722                        TEST 27 - TRANSMIT CHAR LENGTH TIMING TEST - CHAR MODE, CRC
4723                    *
4724                    * THE LINE UNIT IS PLACED IN CHAR MODE (DDCMP) AND A MESSAGE IS INITIATED
4725                    * WITH AN 8-BIT SYNCH AND A 5-BIT SYNCH CHAR. NEXT, A 000 CHAR IS SENT WITH
4726                    * EACH OF THE FOLLOWING TX CHAR LENGTHS : 5 BITS, 6 BITS, 7 BITS, 8 BITS.
4727                    * (FOR EXAMPLE, A 5-BIT CHAR REQUIRES 5 CLOCK CYCLES TO BE TRANSMITTED). TWO
4728                    * TERMINATING SYNCHS ARE SENT AFTER THE DATA.
4729                    ;*****************************************************************************
4730
4731
4732
4733
4734
4735                    ;*****************************************************************************
4736                        TEST 28 - TRANSMIT CHAR LENGTH TIMING TEST - BIT MODE, CRC
4737                    *
4738                    * THE LINE UNIT IS PLACED IN BIT MODE AND A MESSAGE IS INITIATED
4739                    * WITH 2 FLAG CHARS. NEXT, 2 8-BIT 000 CHARS ARE SENT, FOLLOWED BY 000 CHARS
4740                    * WITH EACH OF THE FOLLOWING TRANSMITTER CHAR LENGTHS:
4741                    *    1 BIT, 2 BITS, 3 BITS, 4 BITS, 5 BITS, 6 BITS, 7 BITS, AND 8 BITS.
4742                    * (FOR EXAMPLE, A 5-BIT CHAR REQUIRES 5 CLOCK CYCLES TO BE TRANSMITTED).
4743                    * TWO TERMINATING FLAGS ARE SENT AFTER THE DATA.
4744                    ;*****************************************************************************
4745
4746
4747
4748
4749
4750                    ;*****************************************************************************
4751                        TEST 29 - TXDATA BIT TEST - CHAR MODE, NO CRC
```

```
4752                            *
4753                            * THE LINE UNIT IS INITIALIZED AND A MSG IS INITIATED (USING STEPLU) WITH CRC-
4754                            * 16 SELECTED IN CHAR MODE. TWO SYNCHS, 000,125,252,377,000, AND 2 TERMINATING
4755                            * SYNCHS ARE THEN SENT. THE PROGRAM CHECKS EACH BIT OF THE TRANSMITTED
4756                            * DATA CHARS, BY MONITORING TXDATA (REG 17) AS THE DATA IS CLOCKED OUT OF
4757                            * THE USYRT TRANSMITTER.
4758                            ;*****************************************************************************
4759
4760
4761
4762
4763                            ;*****************************************************************************
4764                                TEST 30 - USYRT RECEIVER MSG TEST - CHAR MODE, CRC
4765                            *
4766                            * THE LINE UNIT IS INITIALIZED AND A MESSAGE IS INITIATED (USING STEPLU) WITH
4767                            * LULP (REG 12) SET TO LOOP THE DATA INTERNALLY IN THE USYRT, AND WITH CRC-16
4768                            * SELECTED. TWO SYNCHS, 000,125,252,377,000, AND FOUR TERMINATING SYNCHS ARE
4769                            * SENT. THE PROGRAM MONITORS IACT, AND THE RCV'D CHARS AND CRC BYTES ARE READ
4770                            * FROM AX0-15 AND COMPARED TO EXPECTED VALUES. THE PROGRAM THEN CHECKS FOR IACT
4771                            *  = 0 AFTER RECEIVER SHUTDOWN.
4772                            ;*****************************************************************************
4773
4774
4775
4776
4777                            ;*****************************************************************************
4778                                TEST 31 - USYRT RECEIVER MSG TEST - BIT MODE, CRC
4779                            *
4780                            * THE LINE UNIT IS INITIALIZED AND A MESSAGE IS INITIATED (USING STEPLU) WITH
4781                            * LULP (REG 12) SET TO LOOP THE DATA INTERNALLY IN THE USYRT, AND WITH CRC-
4782                            * CCITT-1. TWO FLAGS, 000,125,252,377,000, AND TWO TERMINATING FLAGS ARE THEN
4783                            * SENT. THE PROGRAM MONITORS IACT, RSOM, AND THE RCV'D CHARS ARE READ
4784                            * FROM AX0-15 AND COMPARED TO EXPECTED VALUES. THE PROGRAM THEN CHECKS FOR
4785                            * IACT = 0, SETS IC TO CLEAR THE RECEIVER, AND CHECKS FOR IACT STILL = 0.
4786                            ;*****************************************************************************
4787
4788
4789
4790
4791                            ;*****************************************************************************
4792                                TEST 32 - USYRT RECEIVER MSG TEST - CHAR MODE, NO CRC
4793                            *
4794                            * THE LINE UNIT IS INITIALIZED AND A MESSAGE IS INITIATED (USING STEPLU) WITH
4795                            * LULP (REG 12) SET TO LOOP THE DATA INTERNALLY IN THE USYRT, AND WITH NO
4796                            * ERROR DETECTION. TWO SYNCHS, 000,125,252,377,000, AND TWO SYNCHS ARE
4797                            * THEN SENT. THE PROGRAM MONITORS IACT, AND THE RECEIVED CHARS ARE READ FROM
4798                            * AX0-15 AND COMPARED TO EXPECTED VALUES. THE PROGRAM THEN CHECKS FOR IACT
4799                            * STILL = 0, SETS IC TO CLEAR THE RECEIVER, AND CHECKS FOR IACT = 0.
4800                            ;*****************************************************************************
4801
4802
4803
4804
4805
4806
4807
```

```
4808
4809                    ;*******************************************************************************
4810                        TEST 33 - USYRT RECEIVER MSG TEST - BIT MODE, NO CRC
4811                    *
4812                    * THE LINE UNIT IS INITIALIZED AND A MESSAGE IS INITIATED (USING STEPLU) WITH
4813                    * LULP (REG 12) SET TO LOOP THE DATA INTERNALLY IN THE USYRT, AND WITH ERROR
4814                    * DETECTION INHIBITED. TWO FLAGS, 000,125,252,377,000, AND TWO TERMINATING FLAGS
4815                    * ARE THEN SENT. THE PROGRAM MONITORS IACT, RSOM, AND THE RCV'D CHARS ARE
4816                    * READ FROM AX0-15 AND COMPARED TO EXPECTED VALUES. THE PROGRAM THEN CHECKS FOR
4817                    * IACT = 0, SETS IC TO CLEAR THE RECEIVER, AND CHECKS FOR IACT STILL = 0.
4818                    ;*******************************************************************************
4819
4820
4821
4822
4823
4824                    ;*******************************************************************************
4825                        TEST 34 - SILO-DISABLED TRANSMITTER LOAD TEST
4826                    *
4827                    * THIS TEST DISABLES THE SILOS, LOADS A 125 CHARACTER INTO THE TX SILO, AND
4828                    * READS AX1-15 AND CHECKS THAT THE DATA DID NOT GET LOADED INTO THE USYRT TX
4829                    * BUFFER.
4830                    ;*******************************************************************************
4831
4832
4833
4834
4835
4836                    ;*******************************************************************************
4837                        TEST 35 - SILO-DISABLED MESSAGE TEST - BIT MODE, NO CRC
4838                    *
4839                    * THE LINE UNIT IS INITIALIZED AND A MESSAGE IS INITIATED (USING STEPLU)
4840                    * WITH LULP (REG 12) SET TO LOOP THE DATA INTERNALLY IN THE USYRT, WITH SILO
4841                    * DISABLE SET, AND WITH NO ERROR DETECTION. TWO FLAGS, 000,125,252, AND
4842                    * TERMINATING FLAGS ARE THEN SENT BY LOADING THE TRANSMITTED CHARS INTO
4843                    * REG AX1. THE PROGRAM MONITORS OACT, IACT, RSOM, REOM, ORDY, OCOR, ICIR,
4844                    * IRDY, AND THE RECEIVED CHARS ARE READ FROM AX0 AND COMPARED TO EXPECTED
4845                    * VALUES.
4846                    ;*******************************************************************************
4847
4848
4849
4850
4851
4852                    ;*******************************************************************************
4853                        TEST 36 - RECEIVER BUFFER TEST - CHAR MODE, CRC
4854                    *
4855                    * FIRST, A MASTER CLEAR IS DONE AND THE PROGRAM CHECKS FOR ICIR = 1 AND IRDY
4856                    * = 0. THEN, 2 SOM CHARS ARE LOADED AND CLOCKED INTO THE USYRT, AND 64
4857                    * BYTES OF A 256-BYTE BINARY COUNT DATA PATTERN (000-377) ARE LOADED INTO
4858                    * THE TX SILO.
4859                    * THE LINE UNIT IS THEN CLOCKED UNTIL IRDY = 1, AND THE PROGRAM CHECKS FOR
4860                    * THIS TO OCCUR WITHIN 40-43 CYCLES. THE PROGRAM READS THE RCV SILO, CHECKS THE
4861                    * CHAR FOR 000, AND CHECKS FOR IRDY = 0 AGAIN.
4862                    * THE LINE UNIT IS THEN CLOCKED IN GROUPS OF 8 CYCLES, AND AFTER EACH, THE
4863                    * 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.
                        ;*****************************************************************************
```

```
4920
4921
4922
4923                    ;*****************************************************************************
4924                        TEST 40 - MSG TERMINATION WITH GA CHARS - BIT MODE,NO CRC
4925                    *
4926                    * THE DEVICE IS ENABLED FOR TRANSMIT AND RECEIVE, AND A MESSAGE IS
4927                    * INITIATED IN BIT MODE.
4928                    * 2 FLAG CHARACTERS ARE SENT, FOLLOWED BY
4929                    * THE FOLLOWING DATA CHARACTERS : 000, 125, 252, 377, 000. THEN THE LOOP
4930                    * MODE BIT (STRIP) IS SET AND 2 TERMINATING GO-AHEAD CHARACTERS ARE
4931                    * SENT. EACH USYRT RCV FLAG IS TIMED AS IT IS RECEIVED, AND THE 5 DATA
4932                    * WORDS ARE READ AND COMPARED TO EXPECTED VALUES.
4933                    * ALSO, THE FIRST GA CHAR IS CHECKED BY SCANNING THE TXDATA BIT AS THE GA
4934                    * IS BEING TRANSMITTED (GA = 376 OCTAL).
4935                    * THE TEST ALSO CHECKS FOR SETTING OF RAB AND EBLK
4936                    * IN LOOP MODE.
4937                    ;*****************************************************************************
4938
4939
4940
4941
4942
4943                    ;*****************************************************************************
4944                        TEST 41 - IDLE SYNCHS TEST - CHAR MODE
4945                    *
4946                    * THE DEVICE IS ENABLED FOR TRANSMIT AND RECEIVE, AND A MESSAGE IS
4947                    * INITIATED IN CHAR MODE. 24(DEC) SYNCHS ARE SENT.
4948                    * EACH SYNCH IS TIMED AS IT IS RECEIVED, AND THE BITS ARE CHECKED
4949                    * FOR A VALID SYNCH CHAR FOR EACH OF THE 22 SYNCHS WHICH FOLLOW
4950                    * THE FIRST TWO (THESE PERFORM SYNCHRONIZATION, AND ARE NOT READ).
4951                    * WHILE THE LAST SYNCH IS BEING TRANSMITTED, OC IS SET, AND THE
4952                    * NEXT CHAR RCV'D AFTER THE SYNCH IS CHECKED TO BE 377 (LINE MARKING).
4953                    * THEN, A MASTER CLEAR IS ISSUED.
4954                    * THE SYNCH CHAR USED IS 226 (OCTAL).
4955                    ;*****************************************************************************
4956
4957
4958
4959
4960
4961                    ;*****************************************************************************
4962                        TEST 42 - STRIP SYNCH TEST
4963                    *
4964                    * THE DEVICE IS ENABLED FOR TRANSMIT AND RECEIVE, AND A MESSAGE IS
4965                    * INITIATED IN CHAR MODE AND WITH THE STRIP SYNCH
4966                    * BIT SET. THEN 24 (DEC) SYNCHS ARE SENT
4967                    * FOLLOWED BY THE FOLLOWING DATA CHARACTERS : 377, 000, 125, 252,
4968                    * AND THEN 2 TERMINATING SYNCHS.
4969                    * EACH OF THE 23 SYNCHS AFTER THE FIRST ARE CHECKED AT THE TRANSMITTER OUTPUT,
4970                    * BY SCANNING THE TXDATA BIT.
4971                    * EACH USYRT RCV FLAG IS TIMED AS IT IS RECEIVED, AND THE 4 DATA WORDS
4972                    * ARE READ AND COMPARED TO EXPECTED VALUES.
4973                    * FINALLY, THE LINE UNIT IS CLOCKED FOR SEVERAL CHAR TIMES, AND A CHECK
4974                    * IS MADE FOR OACT = 0 (TEOM SHOULD CAUSE TX ENABLE TO DROP).
4975                    * 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
```

```
5032
5033                            ***** DATA PATTERN E *****
5034                            PATE:
5035                                    .BYTE   000
5036                                    .BYTE   120
5037                                    .BYTE   020
5038                                    .BYTE   100
5039                                    .BYTE   120
5040                                    .BYTE   000
5041
5042                            ***** DATA PATTERN F *****
5043                            PATF:
5044                                    .BYTE   050
5045                                    .BYTE   051
5046                                    .BYTE   050
5047
5048                            ***** DATA PATTERN G *****
5049                            PATG:
5050                                    .BYTE   000
5051                                    .BYTE   000
5052                                    .BYTE   240
5053                                    .BYTE   120
5054                                    .BYTE   177
5055                                    .BYTE   000
5056                                    .BYTE   000
5057                                    .BYTE   001
5058
5059                            ***** DATA PATTERN H *****
5060                            PATH:
5061                                    .BYTE   000
5062                                    .BYTE   000
5063                                    .BYTE   377
5064                                    .BYTE   017
5065                                    .BYTE   377
5066                                    .BYTE   377
5067                                    .BYTE   375
5068                                    .BYTE   377
5069
5070                            ***** DATA PATTERN I *****
5071                            PATI:
5072                                    .BYTE   000
5073                                    .BYTE   000
5074                                    .BYTE   000
5075                                    .BYTE   000
5076                                    .BYTE   000
5077                                    .BYTE   103
5078                                    .BYTE   000
5079                                    .BYTE   000
5080
5081                            ***** DATA PATTERN J *****
5082                            PATJ:
5083                                    .BYTE   000
5084                                    .BYTE   000
5085                                    .BYTE   010
5086                                    .BYTE   002
5087                                    .BYTE   004
```

```
5088                                    .BYTE   103
5089                                    .BYTE   001
5090                                    .BYTE   100
5091
5092                            ***** DATA PATTERN K *****
5093                            PATK:   .BYTE   000
5094                                    .BYTE   000
5095                                    .BYTE   377
5096                                    .BYTE   377
5097                                    .BYTE   125
5098                                    .BYTE   125
5099                                    .BYTE   252
5100                                    .BYTE   252
5101                                    .BYTE   001
5102                                    .BYTE   000
5103                                    .BYTE   002
5104                                    .BYTE   000
5105                                    .BYTE   004
5106                                    .BYTE   000
5107                                    .BYTE   010
5108                                    .BYTE   000
5109                                    .BYTE   020
5110                                    .BYTE   000
5111                                    .BYTE   040
5112                                    .BYTE   000
5113                                    .BYTE   100
5114                                    .BYTE   000
5115                                    .BYTE   200
5116                                    .BYTE   000
5117                                    .BYTE   000
5118                                    .BYTE   001
5119                                    .BYTE   000
5120                                    .BYTE   002
5121                                    .BYTE   000
5122                                    .BYTE   004
5123                                    .BYTE   000
5124                                    .BYTE   010
5125                                    .BYTE   000
5126                                    .BYTE   020
5127                                    .BYTE   000
5128                                    .BYTE   040
5129                                    .BYTE   000
5130                                    .BYTE   100
5131                                    .BYTE   000
5132                                    .BYTE   200
5133                                    .BYTE   376
5134                                    .BYTE   377
5135                                    .BYTE   375
5136                                    .BYTE   377
5137                                    .BYTE   373
5138                                    .BYTE   377
5139                                    .BYTE   367
5140                                    .BYTE   377
5141                                    .BYTE   357
5142                                    .BYTE   377
5143                                    .BYTE   337
```

```
5144                                    .BYTE   377
5145                                    .BYTE   277
5146                                    .BYTE   377
5147                                    .BYTE   177
5148                                    .BYTE   377
5149                                    .BYTE   377
5150                                    .BYTE   376
5151                                    .BYTE   377
5152                                    .BYTE   375
5153                                    .BYTE   377
5154                                    .BYTE   373
5155                                    .BYTE   377
5156                                    .BYTE   367
5157                                    .BYTE   377
5158                                    .BYTE   357
5159                                    .BYTE   377
5160                                    .BYTE   337
5161                                    .BYTE   377
5162                                    .BYTE   277
5163                                    .BYTE   377
5164                                    .BYTE   177
5165
5166                            ***** DATA PATTERN L *****
5167                            PATL:
5168                                    .BYTE   000
5169                                    .BYTE   000
5170                                    .BYTE   377
5171                                    .BYTE   377
5172                                    .BYTE   000
5173                                    .BYTE   000
5174
5175                            ***** DATA PATTERN M *****
5176                            PATM:
5177                                    .BYTE   000
5178                                    .BYTE   020
5179                                    .BYTE   000
5180                                    .BYTE   000
5181                                    .BYTE   200
5182                                    .BYTE   000
5183                                    .BYTE   000
5184                                    .BYTE   051
5185
5186                            ***** DATA PATTERN N *****
5187                            PATN:
5188                                    .BYTE   000
5189                                    .BYTE   000
5190                                    .BYTE   000
5191                                    .BYTE   125
5192                                    .BYTE   000
5193                                    .BYTE   252
5194                                    .BYTE   000
5195                                    .BYTE   377
5196                                    .BYTE   005
5197                                    .BYTE   000
5198                                    .BYTE   012
5199                                    .BYTE   000
```

```
5200                                    .BYTE   017
5201                                    .BYTE   000
5202
5203                                ***** DATA PATTERN 0 *****
5204                                PAT0:
5205                                    .BYTE   000
5206                                    .BYTE   041
5207                                    .BYTE   004
5208                                    .BYTE   010
5209                                    .BYTE   020
5210                                    .BYTE   040
5211                                    .BYTE   100
5212                                    .BYTE   101
5213                                    .BYTE   200
5214                                    .BYTE   201
5215                                    .BYTE   300
5216                                    .BYTE   111
5217                                    .BYTE   301
5218                                    .BYTE   375
5219
5220                                ***** DATA PATTERN P *****
5221                                PATP:
5222                                    .BYTE   000
5223                                    .BYTE   113
5224                                    .BYTE   200
5225                                    .BYTE   040
5226                                    .BYTE   020
5227                                    .BYTE   010
5228                                    .BYTE   001
5229                                    .BYTE   104
5230                                    .BYTE   007
5231                                    .BYTE   105
5232                                    .BYTE   007
5233                                    .BYTE   144
5234                                    .BYTE   107
5235                                    .BYTE   157
5236
5237                                ***** DATA PATTERN U *****
5238                                PATU:   .BYTE   000
5239                                    .BYTE   000
5240                                    .BYTE   001
5241                                    .BYTE   000
5242                                    .BYTE   013
5243                                    .BYTE   000
5244                                    .BYTE   011
5245                                    .BYTE   000
5246                                    .BYTE   021
5247                                    .BYTE   000
5248                                    .BYTE   101
5249                                    .BYTE   000
5250                                    .BYTE   301
5251                                    .BYTE   000
5252                                    .BYTE   000
5253                                    .BYTE   001
5254                                    .BYTE   000
5255                                    .BYTE   002
```

```
5256                                    .BYTE   000
5257                                    .BYTE   004
5258                                    .BYTE   000
5259                                    .BYTE   040
5260                                    .BYTE   000
5261                                    .BYTE   100
5262                                    .BYTE   000
5263                                    .BYTE   200
5264                                    .BYTE   000
5265                                    .BYTE   346
5266                                    .BYTE   000
5267                                    .BYTE   345
5268                                    .BYTE   000
5269                                    .BYTE   343
5270                                    .BYTE   000
5271                                    .BYTE   307
5272                                    .BYTE   000
5273                                    .BYTE   247
5274                                    .BYTE   000
5275                                    .BYTE   147
5276
5277                                ***** DATA PATTERN V *****
5278                                PATV:   .BYTE   000
5279                                        .BYTE   000
5280                                        .BYTE   333
5281                                        .BYTE   000
5282                                        .BYTE   331
5283                                        .BYTE   000
5284                                        .BYTE   323
5285                                        .BYTE   000
5286                                        .BYTE   313
5287                                        .BYTE   000
5288                                        .BYTE   233
5289                                        .BYTE   000
5290                                        .BYTE   133
5291                                        .BYTE   000
5292                                        .BYTE   000
5293                                        .BYTE   001
5294                                        .BYTE   000
5295                                        .BYTE   002
5296                                        .BYTE   000
5297                                        .BYTE   004
5298                                        .BYTE   000
5299                                        .BYTE   040
5300                                        .BYTE   000
5301                                        .BYTE   100
5302                                        .BYTE   000
5303                                        .BYTE   200
5304                                        .BYTE   000
5305                                        .BYTE   346
5306                                        .BYTE   000
5307                                        .BYTE   345
5308                                        .BYTE   000
5309                                        .BYTE   343
5310                                        .BYTE   000
5311                                        .BYTE   307
```

```
5312                                    .BYTE   000
5313                                    .BYTE   247
5314                                    .BYTE   000
5315                                    .BYTE   147
5316
5317
5318
5319
5320
5321
```

9.0 ERROR INFORMATION

9.1 ERROR REPORTING

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

THE FOLLOWING EXAMPLE PROVIDES A TYPICAL ERROR REPORT, WHICH DESCRIBES 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
```

```
5379
5380
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5382                    @
5383
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5387
```

```
                                .TITLE CZDMRA 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,A,0,45.,0
 (4)  002000                                                        L$NAME::
 (4)  002000       103                                                      .ASCII /C/
 (4)  002001       132                                                      .ASCII /Z/
 (4)  002002       104                                                      .ASCII /D/
 (4)  002003       115                                                      .ASCII /M/
 (4)  002004       122                                                      .ASCII /R/
 (6)  002005       000                                                      .BYTE   0
 (6)  002006       000                                                      .BYTE   0
 (5)  002007       000                                                      .BYTE   0
 (5)  002010                                                        L$REV::
 (4)  002010       101                                                      .ASCII  /A/
 (5)  002011                                                        L$DEPO::
 (4)  002011       060                                                      .ASCII  /0/
 (5)  002012                                                        L$UNIT::
 (4)  002012    000000                                                      .WORD   0
 (5)  002014                                                        L$TIML::
 (4)  002014    000055                                                      .WORD   45.
 (5)  002016                                                        L$HPCP::
 (4)  002016    035514                                                      .WORD   L$HARD
 (5)  002020                                                        L$SPCP::
 (4)  002020    000000                                                      .WORD   0
 (5)  002022                                                        L$HPTP::
 (4)  002022    002252                                                      .WORD   L$HW
 (5)  002024                                                        L$SPTP::
 (4)  002024    000000                                                      .WORD   0
 (5)  002026                                                        L$LADP::
 (4)  002026    036172                                                      .WORD   L$LAST
 (5)  002030                                                        L$STA::
 (4)  002030    000000                                                      .WORD   0
 (5)  002032                                                        L$CO::
 (4)  002032    000000                                                      .WORD   0
 (5)  002034                                                        L$DTYP::
 (4)  002034    000000                                                      .WORD   0
 (5)  002036                                                        L$APT::
 (4)  002036    000000                                                      .WORD   0
 (5)  002040                                                        L$DTP::
 (4)  002040    002124                                                      .WORD   L$DISPATCH
 (5)  002042                                                        L$EXP1::
 (4)  002042    000000                                                      .WORD   0
 (5)  002044                                                        L$EXP2::
 (4)  002044    000000                                                      .WORD   0
```

```
(5)  002046                              L$EXP3::
(4)  002046  000000                               .WORD   0
(5)  002050                              L$MREV::
(4)  002050     003                               .BYTE   C$REVISION
(3)  002051     000                               .BYTE   C$EDIT
(5)  002052                              L$EF::
(4)  002052  000000                               .WORD   0
(5)  002054  000000                               .WORD   0
(5)  002056                              L$SPC::
(4)  002056  000000                               .WORD   0
(5)  002060                              L$DEVP::
(4)  002060  003462                               .WORD   L$DVTYP
(5)  002062                              L$REPP::
(4)  002062  000000                               .WORD   0
(5)  002064                              L$EXP4::
(4)  002064  000000                               .WORD   0
(5)  002066                              L$EXP5::
(4)  002066  000000                               .WORD   0
(5)  002070                              L$AUT::
(4)  002070  021606                               .WORD   L$AU
(5)  002072                              L$DUT::
(4)  002072  021524                               .WORD   L$DU
(5)  002074                              L$LUN::
(4)  002074  000000                               .WORD   0
(5)  002076                              L$DESP::
(4)  002076  003470                               .WORD   L$DESC
(5)  002100                              L$LOAD::
(4)  002100  104035                               EMT     E$LOAD
(5)  002102                              L$ETP::
(4)  002102  000000                               .WORD   0
(5)  002104                              L$ICP::
(4)  002104  021072                               .WORD   L$INIT
(5)  002106                              L$CCP::
(4)  002106  021522                               .WORD   L$CLEAN
(5)  002110                              L$ACP::
(4)  002110  021442                               .WORD   L$AUTO
(5)  002112                              L$PRT::
(4)  002112  021064                               .WORD   L$PROT
(5)  002114                              L$TEST::
(4)  002114  000000                               .WORD   0
(5)  002116                              L$DLY::
(4)  002116  000000                               .WORD   0
(5)  002120                              L$HIME::
(4)  002120  000000                               .WORD   0

                        ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
                        ;       CHANGE THE ''HEADER'' TO CONTAIN THE PROPER ARGUMENTS.
                        ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

                        .EVEN
```

```
                        .SBTTL  DISPATCH TABLE

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

 5469  002122                 DISPATCH 42
  (4)  002122  000052                                                    .WORD   42
  (3)  002124                                                  L$DISPATCH::
  (6)  002124  021610                                                    .WORD   T1
  (6)  002126  021672                                                    .WORD   T2
  (6)  002130  021756                                                    .WORD   T3
  (6)  002132  022102                                                    .WORD   T4
  (6)  002134  022204                                                    .WORD   T5
  (6)  002136  022324                                                    .WORD   T6
  (6)  002140  022444                                                    .WORD   T7
  (6)  002142  022620                                                    .WORD   T8
  (6)  002144  023054                                                    .WORD   T9
  (6)  002146  023172                                                    .WORD   T10
  (6)  002150  023310                                                    .WORD   T11
  (6)  002152  023426                                                    .WORD   T12
  (6)  002154  023544                                                    .WORD   T13
  (6)  002156  024174                                                    .WORD   T14
  (6)  002160  024526                                                    .WORD   T15
  (6)  002162  025016                                                    .WORD   T16
  (6)  002164  025226                                                    .WORD   T17
  (6)  002166  025432                                                    .WORD   T18
  (6)  002170  025636                                                    .WORD   T19
  (6)  002172  026066                                                    .WORD   T20
  (6)  002174  026320                                                    .WORD   T21
  (6)  002176  026572                                                    .WORD   T22
  (6)  002200  027250                                                    .WORD   T23
  (6)  002202  027370                                                    .WORD   T24
  (6)  002204  027500                                                    .WORD   T25
  (6)  002206  027674                                                    .WORD   T26
  (6)  002210  030240                                                    .WORD   T27
  (6)  002212  030450                                                    .WORD   T28
  (6)  002214  031000                                                    .WORD   T29
  (6)  002216  031100                                                    .WORD   T30
  (6)  002220  031450                                                    .WORD   T31
  (6)  002222  032012                                                    .WORD   T32
  (6)  002224  032262                                                    .WORD   T33
  (6)  002226  032624                                                    .WORD   T34
  (6)  002230  032754                                                    .WORD   T35
  (6)  002232  033666                                                    .WORD   T36
  (6)  002234  034150                                                    .WORD   T37
  (6)  002236  034350                                                    .WORD   T38
  (6)  002240  034650                                                    .WORD   T39
  (6)  002242  034740                                                    .WORD   T40
  (6)  002244  035102                                                    .WORD   T41
  (6)  002246  035250                                                    .WORD   T42

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

```
5475                            ;%%%
```

```
                        .SBTTL  DEFAULT HARDWARE P-TABLE

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

002250                          BGNHW   DFPTBL
(3) 002250  000013                                                      .WORD   L10000-L$HW/2
(3) 002252                                                          L$HW::
(3) 002252                                                          DFPTBL::

002252  000007                  .WORD       7       ;MICROPROCESSOR TYPE = M8207
002254  160170                  .WORD  160170       ;DMC11 OR KMC11 CSR UNIBUS ADDRESS
002256  000300                  .WORD     300       ;DMC11 OR KMC11 INTERRUPT VECTOR
002260  005000                  .WORD    5000       ;DMC11 OR KMC11 INTERRUPT PRIORITY LEVEL = 5
002262  000003                  .WORD       3       ;LINE UNIT = M8203
002264  000056                  .WORD      056      ;SWITCH PACK #1 (REG 11)
002266  000000                  .WORD      000      ;SWITCH PACK #2 (REG 15)
002270  000000                  .WORD      000      ;SWITCH PACK #3 (REG 16)
002272  000000                  .WORD       0       ;H3254&H3255 USED
002274  000004                  .WORD       4       ;BAUD RATE = 56 K
002276  000001                  .WORD       1       ;RUN SWITCH ON MICROPROCESSOR IS ON

002300                          ENDHW
(3) 002300                                                          L10000:
```

```
                                .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
(3)  002300  000000                                                     .WORD   L10001-L$SW/2
(3)  002302                                                     L$SW::
(3)  002302                                                     SFPTBL::

002302                                  ENDSW
(3)  002302                                                     L10001:
```

```
                                .SBTTL  GLOBAL EQUATES SECTION

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

002302                          EQUALS
(1)                             ;
(1)                             ; BIT DIFINITIONS
(1)                             ;
(1)             100000          BIT15== 100000
(1)             040000          BIT14== 40000
(1)             020000          BIT13== 20000
(1)             010000          BIT12== 10000
(1)             004000          BIT11== 4000
(1)             002000          BIT10== 2000
(1)             001000          BIT09== 1000
(1)             000400          BIT08== 400
(1)             000200          BIT07== 200
(1)             000100          BIT06== 100
(1)             000040          BIT05== 40
(1)             000020          BIT04== 20
(1)             000010          BIT03== 10
(1)             000004          BIT02== 4
(1)             000002          BIT01== 2
(1)             000001          BIT00== 1
(1)                             ;
(1)             001000          BIT9==  BIT09
(1)             000400          BIT8==  BIT08
(1)             000200          BIT7==  BIT07
(1)             000100          BIT6==  BIT06
(1)             000040          BIT5==  BIT05
(1)             000020          BIT4==  BIT04
(1)             000010          BIT3==  BIT03
(1)             000004          BIT2==  BIT02
(1)             000002          BIT1==  BIT01
(1)             000001          BIT0==  BIT00
(1)                             ;
(1)                             ; EVENT FLAG DEFINITIONS
(1)                             ;   EF32:EF17 RESERVED FOR SUPERVISOR TO PROGRAM COMMUNICATION
(1)                             ;
(1)             000040          EF.START==      32.                             ; START COMMAND WAS ISSUED
(1)             000037          EF.RESTART==    31.                             ; RESTART COMMAND WAS ISSUED
```

```
(1)          000036                EF.CONTINUE==   30.                    ; CONTINUE COMMAND WAS ISSUED
(1)          000035                EF.NEW==        29.                    ; A NEW PASS HAS BEEN STARTED
(1)          000034                EF.PWR==        28.                    ; A POWER-FAIL/POWER-UP OCCURRED
(1)                                ;
(1)                                ;
(1)                                ; PRIORITY LEVEL DEFINITIONS
(1)                                ;
(1)          000340                PRI07== 340
(1)          000300                PRI06== 300
(1)          000240                PRI05== 240
(1)          000200                PRI04== 200
(1)          000140                PRI03== 140
(1)          000100                PRI02== 100
(1)          000040                PRI01== 40
(1)          000000                PRI00== 0
(1)                                ;
(1)                                ;OPERATOR FLAG BITS
(1)                                ;
(1)          000004                EVL==        4
(1)          000010                LOT==       10
(1)          000020                ADR==       20
(1)          000040                IDU==       40
(1)          000100                ISR==      100
(1)          000200                UAM==      200
(1)          000400                BOE==      400
(1)          001000                PNT==     1000
(1)          002000                PRI==     2000
(1)          004000                IXE==     4000
(1)          010000                IBE==    10000
(1)          020000                IER==    20000
(1)          040000                LOE==    40000
(1)          100000                HOE==   100000
5550
5551
5552
5553
5554                               ;;*****************************************************************************
5555                               ;* PROGRAM EVENT FLAG DEFINITIONS
5556                               ;;*****************************************************************************
5557
5558
5559
5560
5561
5562                               ;;*****************************************************************************************
5563                               ;* MAINTENANCE REGISTER - BSEL1
5564                               ;;*****************************************************************************************
5565          000200               RUN     = BIT7
5566          000100               MCLR    = BIT6
5567          000020               STEPLU  = BIT4
5568          000010               LULOOP  = BIT3
5569          000004               ROMO    = BIT2
5570          000002               ROMI    = BIT1
5571          000001               STEPMP  = BIT0
5572
5573                               ;;*****************************************************************************************
```

```
                        ;* OBUS REG 10 - TRANSMITTER BUFFER
                        ;;*****************************************************************************
000200                  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
```

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

```
5686            000200                  READY   = BIT7
5687            000100                  TXEN    = BIT6
5688            000040                  DISSI   = BIT5
5689            000020                  RDAX    = BIT4
5690            000010                  WAX     = BIT3
5691            000004                  ENAX    = BIT2
5692            000002                  AX2     = BIT1
5693            000001                  AX1     = BIT0
5694
5695                                    ;;**************************************************************************************
5696                                    ;* IBUS REG 17
5697                                    ;;**************************************************************************************
5698            000200                  SIGR    = BIT7
5699            000100                  SIGQ    = BIT6
5700            000040                  TXDATA  = BIT5
5701            000020                  OCOR    = BIT4
5702            000010                  ICIR    = BIT3
5703            000004                  TESTMD  = BIT2
5704            000002                  MCLK    = BIT1
5705            000001                  DDCMP   = BIT0
5706
5707                                    ;;**************************************************************************************
5708                                    ;* AX0-15 - USYRT REG 0 (READ ONLY)
5709                                    ;;**************************************************************************************
5710            000200                  RX7     = BIT7
5711            000100                  RX6     = BIT6
5712            000040                  RX5     = BIT5
5713            000020                  RX4     = BIT4
5714            000010                  RX3     = BIT3
5715            000004                  RX2     = BIT2
5716            000002                  RX1     = BIT1
5717            000001                  RX0     = BIT0
5718
5719                                    ;;**************************************************************************************
5720                                    ;* AX0-16 - USYRT REG 1 (READ ONLY)
5721                                    ;;**************************************************************************************
5722            000200                  RERR    = BIT7
5723            000100                  ASBC2   = BIT6
5724            000040                  ASBC1   = BIT5
5725            000020                  ASBC0   = BIT4
5726            000010                  ROR     = BIT3
5727            000004                  RABT    = BIT2
5728            000002                  REOM    = BIT1
5729            000001                  RSOM    = BIT0
5730
5731                                    ;;**************************************************************************************
5732                                    ;* AX1-15 - USYRT REG 2
5733                                    ;;**************************************************************************************
5734            000200                  TX7     = BIT7
5735            000100                  TX6     = BIT6
5736            000040                  TX5     = BIT5
5737            000020                  TX4     = BIT4
5738            000010                  TX3     = BIT3
5739            000004                  TX2     = BIT2
5740            000002                  TX1     = BIT1
5741            000001                  TX0     = BIT0
```

```
5742
5743                            ;;*****************************************************************************
5744                            ;* AX1-16 - USYRT REG 3
5745                            ;;*****************************************************************************
5746    000200                  TERR    = BIT7
5747    000010                  TXGA    = BIT3
5748    000004                  TXAB    = BIT2
5749    000002                  TEOM    = BIT1
5750    000001                  TSOM    = BIT0
5751
5752                            ;;*****************************************************************************
5753                            ;* AX2-15 - USYRT REG 4
5754                            ;;*****************************************************************************
5755    000200                  SYN7    = BIT7
5756    000100                  SYN6    = BIT6
5757    000040                  SYN5    = BIT5
5758    000020                  SYN4    = BIT4
5759    000010                  SYN3    = BIT3
5760    000004                  SYN2    = BIT2
5761    000002                  SYN1    = BIT1
5762    000001                  SYN0    = BIT0
5763    000226                  SYNCH   = 226
5764
5765                            ;;*****************************************************************************
5766                            ;* AX2-16 - USYRT REG 5
5767                            ;;*****************************************************************************
5768    000200                  APA     = BIT7
5769    000100                  DDC     = BIT6
5770    000040                  STR     = BIT5
5771    000020                  SEC     = BIT4
5772    000010                  IDL     = BIT3
5773    000004                  CRCTY2  = BIT2
5774    000002                  CRCTY1  = BIT1
5775    000001                  CRCTY0  = BIT0
5776
5777                            ;;*****************************************************************************
5778                            ;* AX3-15 - USYRT REG 6
5779                            ;;*****************************************************************************
5780    000200                  I422    = BIT7
5781    000100                  XYZ     = BIT6
5782    000020                  V35     = BIT4
5783    000010                  INTGRL  = BIT3
5784    000002                  OP      = BIT1
5785    000001                  TEST    = BIT0
5786    000332                  AX315U  = I422!XYZ!V35!INTGRL!OP
5787
5788                            ;;*****************************************************************************
5789                            ;* AX3-16 - USYRT REG 7
5790                            ;;*****************************************************************************
5791    000200                  TXLEN2  = BIT7
5792    000100                  TXLEN1  = BIT6
5793    000040                  TXLEN0  = BIT5
5794    000004                  RXLEN2  = BIT2
5795    000002                  RXLEN1  = BIT1
5796    000001                  RXLEN0  = BIT0
5797
```

```
5798
5799
5800
5801
5802                    ;*****************************************************************************
5803                    ;* TX CONTROL BITS DEFINED ON WORD BASIS
5804                    ;*****************************************************************************
5805    004000          TXGOA   = BIT11
5806    002000          TXABT   = BIT10
5807    001000          TXEOM   = BIT9
5808    000400          TXSOM   = BIT8
5809
5810
5811
5812
5813
5814                    ;*****************************************************************
5815                    ;* RCV CONTROL BITS DEFINED ON WORD BASIS
5816                    ;*****************************************************************
5817    004000          RXOVR   = BIT11
5818    002000          RXABT   = BIT10
5819    001000          RXEBL   = BIT9
5820    000400          RXBCC   = BIT8
5821
5822
5823
5824
5825                    ;*****************************************************************************
5826                    ;* ADDRESS EQUATES FOR REGISTER STORAGE TABLE (LUREG:)
5827                    ;*****************************************************************************
5828    002302          LUR10   = LUREG+0       ;LINE UNIT IBUS REG 10
5829    002304          LUR11   = LUREG+2       ;LINE UNIT IBUS REG 11
5830    002306          LUR12   = LUREG+4       ;LINE UNIT IBUS REG 12
5831    002310          LUR13   = LUREG+6       ;LINE UNIT IBUS REG 13
5832    002312          LUR14   = LUREG+10      ;LINE UNIT IBUS REG 14
5833    002314          LUR15   = LUREG+12      ;LINE UNIT IBUS REG 15
5834    002316          LUR16   = LUREG+14      ;LINE UNIT IBUS REG 16
5835    002320          LUR17   = LUREG+16      ;LINE UNIT IBUS REG 17
5836    002322          AX0.15  = LUREG+20      ;USYRT REG 0
5837    002324          AX0.16  = LUREG+22      ;USYRT REG 1
5838    002326          AX1.15  = LUREG+24      ;USYRT REG 2
5839    002330          AX1.16  = LUREG+26      ;USYRT REG 3
5840    002332          AX2.15  = LUREG+30      ;USYRT REG 4
5841    002334          AX2.16  = LUREG+32      ;USYRT REG 5
5842    002336          AX3.15  = LUREG+34      ;USYRT REG 6
5843    002340          AX3.16  = LUREG+36      ;USYRT REG 7
5844
5845
5846
5847
5848
5849    100000          CHPCHK  = BIT15
5850
5851    100000          BCCCHK  = BIT15
5852    100000          CRCCHK  = BIT15
5853
```

```
5854
5855
5856
5857
5858                    ;*****************************************************************************
5859                    ;* MICROINSTRUCTION DEFINITIONS
5860                    ;*****************************************************************************
5861    021000          MVIOX   = 021000            ;MOVE IBUS TO OBUS*
5862    122000          MVIXO   = 122000            ;MOVE IBUS* TO OBUS
5863    121000          MVIXOX  = 121000            ;MOVE IBUS* TO OBUS*
5864
5865
5866
5867                    ;***** ERROR1 BIT FLAG DEFINITIONS *****
5868    000001          RRDYTO  = BIT0
5869    000002          WRDYTO  = BIT1
5870
5871
5872
5873
5874
```

```
                                .SBTTL  GLOBAL DATA SECTION

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

                                ;;*****************************************************************************
                                ;* STORAGE FOR DEVICE REGISTERS
                                ;;*****************************************************************************
002302  000020                  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:
```

```
5932  002454  160174                  SEL4:   .WORD   160174          ;POINTER TO SEL4
5933  002456  160176                  SEL6:   .WORD   160176          ;POINTER TO SEL6
5934  002460  000300                  MPIVEC: .WORD      300          ;MICROPROCESSOR INPUT INTERRUPT VECTOR
5935  002462  000304                  MPOVEC: .WORD      304          ;MICROPROCESSOR OUTPUT INTERRUPT VECTOR
5936  002464  000240                  MPRIOR: .WORD      240          ;MICROPROCESSOR DEVICE PRIORITY
5937  002466  000000                  LUSWI1: .WORD        0          ;LINE UNIT SWITCH PACK #1
5938  002470  000000                  LUSWI2: .WORD        0          ;LINE UNIT SWITCH PACK #2
5939  002472  000000                  LUSWI3: .WORD        0          ;LINE UNIT SWITCH PACK #3
5940  002474  000000                  TSTCON: .WORD        0          ;TEST CONNECTOR INDICATOR
5941  002476  000000                  RUNINH: .WORD        0          ;RUN SWITCH INDICATOR
5942
5943                                  ;***** STORAGE FOR DATA READ IN ADDRESS TESTS *****
5944  002500      000                 REDDAT: .BYTE   0
5945  002501      000                         .BYTE   0
5946  002502      000                         .BYTE   0
5947  002503      000                         .BYTE   0
5948  002504      000                         .BYTE   0
5949  002505      000                         .BYTE   0
5950  002506      000                         .BYTE   0
5951  002507      000                         .BYTE   0
5952
5953                                  ;;****  GEN'L PURPOSE SCRATCH STORAGE  *****
5954  002510  000000                  REG0:   .WORD   0
5955  002512  000000                  REG1:   .WORD   0
5956  002514  000000                  REG2:   .WORD   0
5957  002516  000000                  REG3:   .WORD   0
5958  002520  000000                  REG4:   .WORD   0
5959  002522  000000                  REG5:   .WORD   0
5960  002524  000000                  REG6:   .WORD   0
5961  002526  000000                  REG7:   .WORD   0
5962
5963                                  ;;****  SCRATCH STORAGE FOR MESSAGE REPORTING   *****
5964  002530  000000                  TMP0:   .WORD   0
5965  002532  000000                  TMP1:   .WORD   0
5966  002534  000000                  TMP2:   .WORD   0
5967  002536  000000                  TMP3:   .WORD   0
5968  002540  000000                  TMP4:   .WORD   0
5969  002542  000000                  TMP5:   .WORD   0
5970  002544  000000                  TMP6:   .WORD   0
5971  002546  000000                  TMP7:   .WORD   0
5972
5973                                  ;***** INBUS LU REG BIT MASKS FOR UNPREDICTABLE BITS *****
5974  002550                          UPBITS:
5975  002550      000                         .BYTE   000             ;MASK FOR REG 10
5976  002551      056                         .BYTE   056             ;MASK FOR REG 11
5977  002552      000                         .BYTE   000             ;MASK FOR REG 12
5978  002553      257                         .BYTE   257             ;MASK FOR REG 13
5979  002554      100                         .BYTE   100             ;MASK FOR REG 14
5980  002555      377                         .BYTE   377             ;MASK FOR REG 15
5981  002556      377                         .BYTE   377             ;MASK FOR REG 16
5982  002557      306                         .BYTE   306             ;MASK FOR REG 17
5983
5984  002560      200                 R14NRW: .BYTE   200             ;REG 14 NON-R/W BITS
5985
5986
5987  002561                          ;***** MASKS FOR EXTENDED REGISTER NON-READ/WRITE BITS *****
                                      ANBITS:
```

```
 5988  002561  377                .BYTE   377             ;MASK FOR AX0-15
 5989  002562  377                .BYTE   377             ;MASK FOR AX0-16
 5990  002563  000                .BYTE   000             ;MASK FOR AX1-15
 5991  002564  360                .BYTE   360             ;MASK FOR AX1-16
 5992  002565  000                .BYTE   000             ;MASK FOR AX2-15
 5993  002566  000                .BYTE   000             ;MASK FOR AX2-16
 5994  002567  004                .BYTE   004             ;MASK FOR AX3-15
 5995  002570  030                .BYTE   030             ;MASK FOR AX3-16
 5996
 5997                          ;***** DATA PATTERN A *****
 5998  002571                  PATA:
 5999  002571  125                .BYTE   125
 6000  002572  252                .BYTE   252
 6001  002573  000                .BYTE   000
 6002  002574  377                .BYTE   377
 6003  002575  001                .BYTE   001
 6004  002576  002                .BYTE   002
 6005  002577  004                .BYTE   004
 6006  002600  010                .BYTE   010
 6007  002601  020                .BYTE   020
 6008  002602  040                .BYTE   040
 6009  002603  100                .BYTE   100
 6010  002604  200                .BYTE   200
 6011  002605  376                .BYTE   376
 6012  002606  375                .BYTE   375
 6013  002607  373                .BYTE   373
 6014  002610  367                .BYTE   367
 6015  002611  357                .BYTE   357
 6016  002612  337                .BYTE   337
 6017  002613  277                .BYTE   277
 6018  002614  177                .BYTE   177
 6019
 6020                          ;***** DATA PATTERN B *****
 6021  002615                  PATB:
 6022  002615  000                .BYTE   000
 6023  002616  000                .BYTE   000
 6024  002617  040                .BYTE   040
 6025  002620  100                .BYTE   100
 6026  002621  220                .BYTE   220
 6027  002622  000                .BYTE   000
 6028  002623  000                .BYTE   000
 6029  002624  051                .BYTE   051
 6030
 6031                          ;***** DATA PATTERN C *****
 6032  002625                  PATC:
 6033  002625  020                .BYTE   020
 6034  002626  020                .BYTE   020
 6035  002627  020                .BYTE   020
 6036
 6037                          ;***** DATA PATTERN D *****
 6038  002630                  PATD:
 6039  002630  000                .BYTE   000
 6040  002631  040                .BYTE   040
 6041  002632  000                .BYTE   000
 6042
 6043                          ;***** DATA PATTERN E *****
```

```
 6044  002633
 6045  002633  000                    PATE:
 6046  002634  120                            .BYTE   000
 6047  002635  020                            .BYTE   120
 6048  002636  100                            .BYTE   020
 6049  002637  120                            .BYTE   100
 6050  002640  000                            .BYTE   120
 6051                                         .BYTE   000
 6052
 6053  002641                         ;***** DATA PATTERN F *****
 6054  002641  050                    PATF:
 6055  002642  051                            .BYTE   050
 6056  002643  050                            .BYTE   051
 6057                                         .BYTE   050
 6058
 6059  002644                         ;***** DATA PATTERN G *****
 6060  002644  000                    PATG:
 6061  002645  000                            .BYTE   000
 6062  002646  240                            .BYTE   000
 6063  002647  120                            .BYTE   240
 6064  002650  177                            .BYTE   120
 6065  002651  000                            .BYTE   177
 6066  002652  000                            .BYTE   000
 6067  002653  001                            .BYTE   000
 6068                                         .BYTE   001
 6069
 6070  002654                         ;***** DATA PATTERN H *****
 6071  002654  000                    PATH:
 6072  002655  000                            .BYTE   000
 6073  002656  377                            .BYTE   000
 6074  002657  017                            .BYTE   377
 6075  002660  377                            .BYTE   017
 6076  002661  377                            .BYTE   377
 6077  002662  375                            .BYTE   377
 6078  002663  377                            .BYTE   375
 6079                                         .BYTE   377
 6080
 6081  002664                         ;***** DATA PATTERN I *****
 6082  002664  000                    PATI:
 6083  002665  000                            .BYTE   000
 6084  002666  000                            .BYTE   000
 6085  002667  000                            .BYTE   000
 6086  002670  000                            .BYTE   000
 6087  002671  103                            .BYTE   000
 6088  002672  000                            .BYTE   103
 6089  002673  000                            .BYTE   000
 6090                                         .BYTE   000
 6091
 6092  002674                         ;***** DATA PATTERN J *****
 6093  002674  000                    PATJ:
 6094  002675  000                            .BYTE   000
 6095  002676  010                            .BYTE   000
 6096  002677  002                            .BYTE   010
 6097  002700  004                            .BYTE   002
 6098  002701  103                            .BYTE   004
 6099  002702  001                            .BYTE   103
                                              .BYTE   001
```

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                                                    J 5
 6100  002703      100                    .BYTE   100
 6101
 6102                                     ;***** DATA PATTERN K *****
 6103  002704      000                    PATK:   .BYTE   000
 6104  002705      000                            .BYTE   000
 6105  002706      377                            .BYTE   377
 6106  002707      377                            .BYTE   377
 6107  002710      125                            .BYTE   125
 6108  002711      125                            .BYTE   125
 6109  002712      252                            .BYTE   252
 6110  002713      252                            .BYTE   252
 6111  002714      001                            .BYTE   001
 6112  002715      000                            .BYTE   000
 6113  002716      002                            .BYTE   002
 6114  002717      000                            .BYTE   000
 6115  002720      004                            .BYTE   004
 6116  002721      000                            .BYTE   000
 6117  002722      010                            .BYTE   010
 6118  002723      000                            .BYTE   000
 6119  002724      020                            .BYTE   020
 6120  002725      000                            .BYTE   000
 6121  002726      040                            .BYTE   040
 6122  002727      000                            .BYTE   000
 6123  002730      100                            .BYTE   100
 6124  002731      000                            .BYTE   000
 6125  002732      200                            .BYTE   200
 6126  002733      000                            .BYTE   000
 6127  002734      000                            .BYTE   000
 6128  002735      001                            .BYTE   001
 6129  002736      000                            .BYTE   000
 6130  002737      002                            .BYTE   002
 6131  002740      000                            .BYTE   000
 6132  002741      004                            .BYTE   004
 6133  002742      000                            .BYTE   000
 6134  002743      010                            .BYTE   010
 6135  002744      000                            .BYTE   000
 6136  002745      020                            .BYTE   020
 6137  002746      000                            .BYTE   000
 6138  002747      040                            .BYTE   040
 6139  002750      000                            .BYTE   000
 6140  002751      100                            .BYTE   100
 6141  002752      000                            .BYTE   000
 6142  002753      200                            .BYTE   200
 6143  002754      376                            .BYTE   376
 6144  002755      377                            .BYTE   377
 6145  002756      375                            .BYTE   375
 6146  002757      377                            .BYTE   377
 6147  002760      373                            .BYTE   373
 6148  002761      377                            .BYTE   377
 6149  002762      367                            .BYTE   367
 6150  002763      377                            .BYTE   377
 6151  002764      357                            .BYTE   357
 6152  002765      377                            .BYTE   377
 6153  002766      337                            .BYTE   337
 6154  002767      377                            .BYTE   377
 6155  002770      277                            .BYTE   277
```

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 6156  002771  377                    .BYTE   377
 6157  002772  177                    .BYTE   177
 6158  002773  377                    .BYTE   377
 6159  002774  377                    .BYTE   377
 6160  002775  376                    .BYTE   376
 6161  002776  377                    .BYTE   377
 6162  002777  375                    .BYTE   375
 6163  003000  377                    .BYTE   377
 6164  003001  373                    .BYTE   373
 6165  003002  377                    .BYTE   377
 6166  003003  367                    .BYTE   367
 6167  003004  377                    .BYTE   377
 6168  003005  357                    .BYTE   357
 6169  003006  377                    .BYTE   377
 6170  003007  337                    .BYTE   337
 6171  003010  377                    .BYTE   377
 6172  003011  277                    .BYTE   277
 6173  003012  377                    .BYTE   377
 6174  003013  177                    .BYTE   177
 6175
 6176                                ;***** DATA PATTERN L *****
 6177  003014                        PATL:
 6178  003014  000                    .BYTE   000
 6179  003015  000                    .BYTE   000
 6180  003016  377                    .BYTE   377
 6181  003017  377                    .BYTE   377
 6182  003020  000                    .BYTE   000
 6183  003021  000                    .BYTE   000
 6184
 6185                                ;***** DATA PATTERN M *****
 6186  003022                        PATM:
 6187  003022  000                    .BYTE   000
 6188  003023  020                    .BYTE   020
 6189  003024  000                    .BYTE   000
 6190  003025  000                    .BYTE   000
 6191  003026  200                    .BYTE   200
 6192  003027  000                    .BYTE   000
 6193  003030  000                    .BYTE   000
 6194  003031  051                    .BYTE   051
 6195
 6196                                ;***** DATA PATTERN N *****
 6197  003032                        PATN:
 6198  003032  000                    .BYTE   000
 6199  003033  000                    .BYTE   000
 6200  003034  000                    .BYTE   000
 6201  003035  125                    .BYTE   125
 6202  003036  000                    .BYTE   000
 6203  003037  252                    .BYTE   252
 6204  003040  000                    .BYTE   000
 6205  003041  377                    .BYTE   377
 6206  003042  005                    .BYTE   005
 6207  003043  000                    .BYTE   000
 6208  003044  012                    .BYTE   012
 6209  003045  000                    .BYTE   000
 6210  003046  017                    .BYTE   017
 6211  003047  000                    .BYTE   000
```

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                                                                    L 5
 6212
 6213                                       ;***** DATA PATTERN O *****
 6214  003050                              PATO:
 6215  003050   000                                .BYTE   000
 6216  003051   041                                .BYTE   041
 6217  003052   004                                .BYTE   004
 6218  003053   010                                .BYTE   010
 6219  003054   020                                .BYTE   020
 6220  003055   040                                .BYTE   040
 6221  003056   100                                .BYTE   100
 6222  003057   101                                .BYTE   101
 6223  003060   200                                .BYTE   200
 6224  003061   201                                .BYTE   201
 6225  003062   300                                .BYTE   300
 6226  003063   111                                .BYTE   111
 6227  003064   301                                .BYTE   301
 6228  003065   375                                .BYTE   375
 6229
 6230                                       ;***** DATA PATTERN P *****
 6231  003066                              PATP:
 6232  003066   000                                .BYTE   000
 6233  003067   113                                .BYTE   113
 6234  003070   200                                .BYTE   200
 6235  003071   040                                .BYTE   040
 6236  003072   020                                .BYTE   020
 6237  003073   010                                .BYTE   010
 6238  003074   001                                .BYTE   001
 6239  003075   104                                .BYTE   104
 6240  003076   007                                .BYTE   007
 6241  003077   105                                .BYTE   105
 6242  003100   007                                .BYTE   007
 6243  003101   144                                .BYTE   144
 6244  003102   107                                .BYTE   107
 6245  003103   157                                .BYTE   157
 6246
 6247                                       ;***** DATA PATTERN U *****
 6248  003104   000                       PATU:    .BYTE   000
 6249  003105   000                                .BYTE   000
 6250  003106   001                                .BYTE   001
 6251  003107   000                                .BYTE   000
 6252  003110   013                                .BYTE   013
 6253  003111   000                                .BYTE   000
 6254  003112   011                                .BYTE   011
 6255  003113   000                                .BYTE   000
 6256  003114   021                                .BYTE   021
 6257  003115   000                                .BYTE   000
 6258  003116   101                                .BYTE   101
 6259  003117   000                                .BYTE   000
 6260  003120   301                                .BYTE   301
 6261  003121   000                                .BYTE   000
 6262  003122   000                                .BYTE   000
 6263  003123   001                                .BYTE   001
 6264  003124   000                                .BYTE   000
 6265  003125   002                                .BYTE   002
 6266  003126   000                                .BYTE   000
 6267  003127   004                                .BYTE   004
```

```
 6268  003130  000                        .BYTE   000
 6269  003131  040                        .BYTE   040
 6270  003132  000                        .BYTE   000
 6271  003133  100                        .BYTE   100
 6272  003134  000                        .BYTE   000
 6273  003135  200                        .BYTE   200
 6274  003136  000                        .BYTE   000
 6275  003137  346                        .BYTE   346
 6276  003140  000                        .BYTE   000
 6277  003141  345                        .BYTE   345
 6278  003142  000                        .BYTE   000
 6279  003143  343                        .BYTE   343
 6280  003144  000                        .BYTE   000
 6281  003145  307                        .BYTE   307
 6282  003146  000                        .BYTE   000
 6283  003147  247                        .BYTE   247
 6284  003150  000                        .BYTE   000
 6285  003151  147                        .BYTE   147
 6286
 6287                             ;***** PATTERN V *****
 6288  003152  000                PATV:   .BYTE   000
 6289  003153  000                        .BYTE   000
 6290  003154  333                        .BYTE   333
 6291  003155  000                        .BYTE   000
 6292  003156  331                        .BYTE   331
 6293  003157  000                        .BYTE   000
 6294  003160  323                        .BYTE   323
 6295  003161  000                        .BYTE   000
 6296  003162  313                        .BYTE   313
 6297  003163  000                        .BYTE   000
 6298  003164  233                        .BYTE   233
 6299  003165  000                        .BYTE   000
 6300  003166  133                        .BYTE   133
 6301  003167  000                        .BYTE   000
 6302  003170  000                        .BYTE   000
 6303  003171  001                        .BYTE   001
 6304  003172  000                        .BYTE   000
 6305  003173  002                        .BYTE   002
 6306  003174  000                        .BYTE   000
 6307  003175  004                        .BYTE   004
 6308  003176  000                        .BYTE   000
 6309  003177  040                        .BYTE   040
 6310  003200  000                        .BYTE   000
 6311  003201  100                        .BYTE   100
 6312  003202  000                        .BYTE   000
 6313  003203  200                        .BYTE   200
 6314  003204  000                        .BYTE   000
 6315  003205  346                        .BYTE   346
 6316  003206  000                        .BYTE   000
 6317  003207  345                        .BYTE   345
 6318  003210  000                        .BYTE   000
 6319  003211  343                        .BYTE   343
 6320  003212  000                        .BYTE   000
 6321  003213  307                        .BYTE   307
 6322  003214  000                        .BYTE   000
 6323  003215  247                        .BYTE   247
```

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6324  003216  000                     .BYTE   000
6325  003217  147                     .BYTE   147
6326
6327  003220                  ENDPAT:
6328                          .EVEN
6329
6330
6331
6332
6333
6334                          ;***  TEST MESSAGES TO BE TRANSMITTED  ***
6335
6336  003220  000400          MSG1:    TXSOM
6337  003222  000400                   TXSOM
6338  003224  000000                   000
6339  003226  000125                   125
6340  003230  000252                   252
6341  003232  000377                   377
6342  003234  000000                   000
6343  003236  001000                   TXEOM
6344  003240  001000                   TXEOM
6345  003242  001000                   TXEOM
6346  003244  001000                   TXEOM
6347
6348  003246  000377          MSG4:    377
6349  003250  000000                   000
6350  003252  000125                   125
6351  003254  000252                   252
6352  003256  001000                   TXEOM
6353  003260  001000                   TXEOM
6354
6355
6356
6357
6358
6359                          ;*** RECEIVED DATA BUFFER (64. WORDS) ***
6360  003262  000100          RCVBUF: .BLKW   64.
6361
6362
6363
6364
6365
6366
6367
6368
6369
6370
```

```
                                        .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>
 (4)  003462                                                                    L$DVTYP::
 (3)  003462  034115  030062  000063                                                    .ASCIZ  /M8203/
 (2)                                                                                    .EVEN

                                        ;;**********************************************************************
                                        ;* TITLE OF PROGRAM
                                        ;;**********************************************************************
      003470                                    DESCRIPT        <M8203 STATIC LOGIC TESTS - PART 1 OF 2>
 (4)  003470                                                                    L$DESC::
 (3)  003470  034115  030062  020063                                                    .ASCIZ  /M8203 STATIC LO
 (3)  003476  052123  052101  041511
 (3)  003504  046040  043517  041511
 (3)  003512  052040  051505  051524
 (3)  003520  026440  050040  051101
 (3)  003526  020124  020061  043117
 (3)  003534  031040     000
 (2)          003540                                                                    .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  112777  000100  176642          MOVB    #MCLR,@BSEL1    ;SET MASTER CLEAR BIT
003606  142777  000300  176634          BICB    #RUN!MCLR,@BSEL1 ;CLEAR RUN AND MCLR BITS
003614  012701  000024                  MOV     #20.,R1         ;INITIALIZE STALL COUNTER
003620  000240                  2$:     NOP                     ;STALL IN LOOP FOR SEVERAL MICRO-SEC
003622  005301                          DEC     R1
003624  001375                          BNE     2$
003626  152777  000010  176614          BISB    #LULOOP,@BSEL1  ;SET LU LOOP
003634  012601                          MOV     (SP)+,R1        ;RESTORE R1
003636  005037  002432                  CLR     SAVLEN          ;CLEAR CHAR LENGTH FROM SETUP
003642  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.
                                ;*******************************************************************************
003644                          READLU:
003644  010146                          MOV     R1,-(SP)        ;SAVE R1
003646  013701  002400                  MOV     REGNUM,R1       ;GET LINE UNIT REG NUMBER
003652  006301                          ASL     R1              ;SHIFT INTO SOURCE BITS 4-7
003654  006301                          ASL     R1
```

```
6463  003656  006301                        ASL     R1
6464  003660  006301                        ASL     R1
6465  003662  052701  000004                BIS     #4,R1           ;SET DESTINATION = BSEL4
6466  003666  052701  021000                BIS     #MVIOX,R1       ;SET REST OF MOVE INSTRUCTION
6467  003672  010137  003702                MOV     R1,2$           ;SET INSTRUCTION AS SUBROUTINE ARGUMENT
6468  003676  004737  003540                JSR     PC,STPCLK       ;EXECUTE MOVE INSTRUCTION
6469  003702  000000              2$:       .WORD   0               ;INSTRUCTION GOES HERE
6470  003704  117737  176544  002364        MOVB    @BSEL4,REDBYT   ;GET LU REG CONTENTS INTO REDBYT
6471  003712  105037  002365                CLRB    REDBYT+1        ;CLR HI BYTE OF STORAGE
6472  003716  012601                        MOV     (SP)+,R1        ;RESTORE R1
6473  003720  000207                        RTS     PC              ;RETURN
6474
6475
6476
6477
6478
6479                                  ;*******************************************************************************
6480                                  ;* WRITLU - THIS SUBROUTINE FORCES THE DMC11 OR KMC11 MICROPROCESSOR TO
6481                                  ;*       EXECUTE AN INSTRUCTION WHICH LOADS THE BYTE CONTAINED IN WRIBYT
6482                                  ;*       INTO THE LU REG WHOSE NUMBER IS PASSED IN REGNUM.
6483                                  ;*******************************************************************************
6484  003722                          WRITLU:
6485  003722  010146                        MOV     R1,-(SP)        ;SAVE R1
6486  003724  013701  002400                MOV     REGNUM,R1       ;GET LINE UNIT REG NUMBER
6487  003730  052701  000100                BIS     #100,R1         ;SET SOURCE = BSEL4
6488  003734  052701  122000                BIS     #MVIXO,R1       ;SET REST OF MOVE INSTRUCTION
6489  003740  010137  003762                MOV     R1,2$           ;SET INSTRUCTION AS SUBROUTINE ARGUMENT
6490  003744  105037  002367                CLRB    WRIBYT+1        ;CLR HI BYTE OF STORAGE
6491  003750  113777  002366  176476        MOVB    WRIBYT,@BSEL4   ;LOAD BYTE INTO BSEL4
6492  003756  004737  003540                JSR     PC,STPCLK       ;EXECUTE MOVE INSTRUCTION
6493  003762  000000              2$:       .WORD   0
6494  003764  012601                        MOV     (SP)+,R1        ;RESTORE R1
6495  003766  000207                        RTS     PC              ;RETURN
6496
6497
6498
6499
6500
6501                                  ;*******************************************************************************
6502                                  ;* GETREG - THIS SUBROUTINE READS THE LINE UNIT REGISTERS 10-17 INTO THE
6503                                  ;*       REGISTER STORAGE TABLE (LUREG:).
6504                                  ;*******************************************************************************
6505  003770  010146                  GETREG: MOV     R1,-(SP)        ;SAVE R1
6506  003772  013746  002400                MOV     REGNUM,-(SP)    ;SAVE CURRENT REG NO.
6507  003776  012701  002302                MOV     #LUR10,R1       ;INIT POINTER TO REG STORAGE TABLE
6508  004002  012737  000010  002400        MOV     #10,REGNUM      ;INIT LU REG NO. TO 10
6509  004010  004737  003644        3$:     JSR     PC,READLU       ;READ A LINE UNIT REG
6510  004014  113721  002364                MOVB    REDBYT,(R1)+    ;PUT BYTE READ INTO TABLE
6511  004020  105021                        CLRB    (R1)+           ;CLEAR UPPER BYTE OF TABLE ENTRY
6512  004022  005237  002400                INC     REGNUM          ;INCREMENT REG NO.
6513  004026  023727  002400  000020        CMP     REGNUM,#20      ;SEE IF ALL REGS READ YET
6514  004034  002765                        BLT     3$              ;BR IF NOT
6515  004036  012637  002400                MOV     (SP)+,REGNUM    ;RESTORE CURRENT REG NO.
6516  004042  012601                        MOV     (SP)+,R1        ;RESTORE R1
6517  004044  000207                        RTS     PC              ;RETURN
6518
```

```
                                ;*******************************************************************************
                                ;* 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.
                                ;*******************************************************************************
004046                          LOOPIN:
004046  152777  000006  176374          BISB    #ROMO!ROMI,@BSEL1       ;SET ROMO, ROMI BITS IN BSEL1
004054  017677  000000  176374          MOV     @(SP),@SEL6     ;PUT MICROINSTRUCTION INTO SEL6
004062  152777  000206  176360          BISB    #RUN!ROMO!ROMI,@BSEL1 ;SET RUN, ROMO, ROMI IN BSEL1
004070  062716  000002                  ADD     #2,(SP)         ;FIX UP RETURN PC
004074  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.
                                ;*******************************************************************************
004076  010146                  READAX: MOV     R1,-(SP)        ;SAVE R1
004100  013746  002400                  MOV     REGNUM,-(SP)    ;STORE CURRENT REG NO.
004104  042737  000001  002420          BIC     #RRDYTO,ERROR1  ;CLEAR ERROR BIT
004112  012737  000014  002400          MOV     #14,REGNUM      ;SET LU REG NO. = 14
004120  113737  002402  002366          MOVB    AXNUM,WRIBYT    ;SET UP AX REG NO. BITS
004126  006237  002366                  ASR     WRIBYT
004132  152737  000024  002366          BISB    #RDAX!ENAX,WRIBYT ;SET UP BITS TO LOAD INTO REG 14
004140  053737  002426  002366          BIS     DISILO,WRIBYT   ;SET PROPER STATE OF DISSI BIT
004146  004737  003722                  JSR     PC,WRITLU       ;SET RDAX AND ENAX IN REG 14
004152  005001                          CLR     R1              ;INIT TIMER
004154  004737  003644          6$:     JSR     PC,READLU       ;READ REG 14
004160  132737  000200  002364          BITB    #READY,REDBYT   ;SEE IF READY BIT SET IN REG 14 YET
004166  001006                          BNE     9$              ;BR IF READY SET
004170  005201                          INC     R1              ;INCR TIMER
004172  001370                          BNE     6$              ;BR IF TIMER DIDN'T TIME OUT YET
004174  052737  000001  002420          BIS     #RRDYTO,ERROR1  ;SET ERROR FLAG FOR TIME OUT ON READ RDY
004202  000424                          BR      12$             ;BR TO RETURN
004204  012737  000015  002400  9$:     MOV     #15,REGNUM      ;SET REG NO. = 15
004212  004737  003644                  JSR     PC,READLU       ;READ REG 15
004216  113737  002364  002370          MOVB    REDBYT,RAX15    ;STORE REG AX-15
004224  105037  002371                  CLRB    RAX15+1         ;CLR HI BYTE OF STORAGE
004230  012737  000016  002400          MOV     #16,REGNUM      ;SET REG NO. = 16
004236  004737  003644                  JSR     PC,READLU       ;READ REG 16
004242  113737  002364  002372          MOVB    REDBYT,RAX16    ;STORE REG AX-16
004250  105037  002373                  CLRB    RAX16+1         ;CLR HI BYTE OF STORAGE
004254  012637  002400          12$:    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.
        MOV     #DH5,TMP0       ;SET AX LO BYTE NO.
```

```
6631  004514  032737  000001  002402          BIT     #BIT0,AXNUM     ;SEE IF LO OR HI BYTE
6632  004522  001403                          BEQ     1$              ;BR IF LO BYTE
6633  004524  012737  014414  002530          MOV     #DH6,TMP0       ;SET AX HI BYTE NO.
6634  004532  004737  003770          1$:     JSR     PC,GETREG       ;READ AND STORE REGS 10-17
6635  004536  142777  000010  175704          BICB    #LULOOP,@BSEL1  ;CLEAR LULOOP
6636  004544  012701  002322                  MOV     #AX0.15,R1      ;INIT POINTER TO REG STORAGE TABLE
6637  004550  005037  002402                  CLR     AXNUM           ;INIT AX REG BYTE NO. TO 0
6638  004554  004737  004076          3$:     JSR     PC,READAX       ;READ 2 AX REG BYTES
6639  004560  113721  002370                  MOVB    RAX15,(R1)+     ;PUT LO BYTE READ INTO TABLE
6640  004564  105021                          CLRB    (R1)+           ;CLEAR UPPER BYTE OF TABLE ENTRY
6641  004566  113721  002372                  MOVB    RAX16,(R1)+     ;PUT HI BYTE READ INTO TABLE
6642  004572  105021                          CLRB    (R1)+           ;CLEAR UPPER BYTE OF TABLE ENTRY
6643  004574  062737  000002  002402          ADD     #2,AXNUM        ;INCR AX REG BYTE NO.
6644  004602  023727  002402  000010          CMP     AXNUM,#10       ;SEE IF ALL REGS READ YET
6645  004610  002761                          BLT     3$              ;BR IF NOT
6646  004612  012637  002402                  MOV     (SP)+,AXNUM     ;RESTORE CURRENT AX REG BYTE NO.
6647  004616  012601                          MOV     (SP)+,R1        ;RESTORE R1
6648  004620  013737  002402  002532          MOV     AXNUM,TMP1
6649  004626  006237  002532                  ASR     TMP1            ;GET EXTENDED REG NO. FOR PRINTOUT
6650  004632  000207                          RTS     PC              ;RETURN
6651
6652
6653
6654
6655
6656                                  ;*****************************************************************************
6657                                  ;* OSIRDY - THIS SUBROUTINE CHECKS FOR THE PROPER STATES OF ORDY (REG 11)
6658                                  ;*      AND OCOR (REG 17) AND REPORTS AN ERROR IF EITHER IS NOT PROPERLY SET
6659                                  ;*      AS PASSED IN BIT 0 (ORDY) AND BIT 1 (OCOR) OF THE WORD FOLLOWING THE
6660                                  ;*      CALL.
6661                                  ;*      IF AN ERROR OCCURS, A RETURN IS MADE TO THE TEST, AT THE ADDRESS IN
6662                                  ;*      RETADR.
6663                                  ;*****************************************************************************
6664  004634  013746  002400          OSIRDY: MOV     REGNUM,-(SP)    ;SAVE LU REG NO.
6665  004640  013746  002352                  MOV     SUBRPC,-(SP)
6666  004644  005737  002352                  TST     SUBRPC          ;SEE IF THIS IS A NESTED CALL
6667  004650  001006                          BNE     1$              ;BR IF YES
6668  004652  016637  000004  002352          MOV     4(SP),SUBRPC
6669  004660  162737  000004  002352          SUB     #4,SUBRPC       ;GET PC OF SUBROUTINE CALL
6670  004666  012737  000011  002400  1$:     MOV     #11,REGNUM      ;SET REG NO. TO 11
6671  004674  004737  003644                  JSR     PC,READLU       ;READ REG 11
6672  004700  032776  000001  000004          BIT     #BIT0,@4(SP)    ;GET EXPECTED STATE OF ORDY
6673  004706  001413                          BEQ     3$              ;BR IF EXPECTED ORDY = 0
6674  004710  132737  000020  002364          BITB    #ORDY,REDBYT    ;SEE IF ORDY = 1
6675  004716  001022                          BNE     9$              ;BR IF ORDY = 1
6676  004720  004737  004500                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
6677                                  ;REPORT ORDY NOT SET
6678  004724                                  ERRDF   7,EM7,ERR4
 (4)  004724  104455                                                          TRAP    C$ERDF
 (5)  004726  000007                                                          .WORD   7
 (5)  004730  012350                                                          .WORD   EM7
 (5)  004732  015576                                                          .WORD   ERR4
6679  004734  000451                          BR      16$             ;TAKE ERROR RETURN
6680  004736  132737  000020  002364  3$:     BITB    #ORDY,REDBYT    ;SEE IF ORDY = 0
6681  004744  001407                          BEQ     9$              ;BR IF ORDY = 0
6682  004746  004737  004500                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
```

```
                                        ;REPORT ORDY NOT CLEARED
                                                ERRDF   8,EM8,ERR4
                                                                                TRAP    C$ERDF
                                                                                .WORD   8
                                                                                .WORD   EM8
                                                                                .WORD   ERR4
                                                BR      16$             ;TAKE ERROR RETURN
000017  002400  9$:           MOV     #17,REGNUM      ;SET REG NO. = 17
003644                         JSR     PC,READLU       ;READ LU REG 17
000002  000004                BITB    #BIT1,@4(SP)    ;GET EXPECTED STATE OF OCOR
                               BEQ     12$             ;BR IF EXPECTED OCOR = 0
000020  002364                BITB    #OCOR,REDBYT    ;SEE IF OCOR = 1
                               BNE     20$             ;BR IF OCOR = 1
004500                         JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                        ;REPORT OCOR NOT SET
                                                ERRDF   9,EM9,ERR4
                                                                                TRAP    C$ERDF
                                                                                .WORD   9
                                                                                .WORD   EM9
                                                                                .WORD   ERR4
                                                BR      16$             ;TAKE ERROR RETURN
000020  002364  12$:           BITB    #OCOR,REDBYT    ;SEE IF OCOR = 0
                               BEQ     20$             ;BR IF OCOR = 0
004500                         JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                        ;REPORT OCOR NOT CLEARED
                                                ERRDF   10,EM10,ERR4
                                                                                TRAP    C$ERDF
                                                                                .WORD   10
                                                                                .WORD   EM10
                                                                                .WORD   ERR4
000002  002400  16$:           MOV     2(SP),REGNUM    ;RESTORE LU REG NO.
002346                         MOV     PSTACK,SP       ;RESTORE STACK POINTER TO BASE LEVEL
002362                         MOV     RETADR,-(SP)    ;FIX ERROR RETURN PC
                               BR      23$
000002  000004  20$:           ADD     #2,4(SP)        ;FIX UP ERROR-FREE RETURN PC
002352                         MOV     (SP)+,SUBRPC
002400                         MOV     (SP)+,REGNUM    ;RESTORE LU REG NO.
                        23$:   RTS     PC              ;RETURN


                        ;*****************************************************************************
                        ;* WAIT50 - THIS SUBROUTINE STALLS FOR AT LEAST 50 MICRO-SEC, AND THEN RETURNS.
                        ;*****************************************************************************
                        WAIT50: MOV     R1,-(SP)        ;SAVE R1
000310                         MOV     #200.,R1        ;INIT COUNTER
                        3$:    DEC     R1              ;DECREMENT COUNTER
                               BNE     3$              ;BR IF NOT DONE YET
                               MOV     (SP)+,R1        ;RESTORE R1
                               RTS     PC              ;RETURN
```

```
                                ;*****************************************************************************
                                ;* STALL - THIS SUBROUTINE STALLS FOR ABOUT A MICRO-SEC.
                                ;*****************************************************************************
005136  000240          STALL:  NOP
005140  000240                  NOP
005142  000240                  NOP
005144  000207                  RTS     PC


                                ;*****************************************************************************
                                ;* LDTXSI - THIS SUBROUTINE LOADS THE TX SILO (REGS 10,11) WITH THE DATA PASSED
                                ;*      IN BITS 0-11 OF TXWORD.
                                ;*****************************************************************************
005146  013746  002400  LDTXSI: MOV     REGNUM,-(SP)    ;SAVE LU REG NO.
005152  042737  170000  002422  BIC     #170000,TXWORD  ;CLEAR UNUSED BITS
005160  012737  000011  002400  MOV     #11,REGNUM      ;SET REG NO. = 11
005166  113737  002423  002366  MOVB    TXWORD+1,WRIBYT ;SET DATA TO BE WRITTEN INTO REG 11
005174  004737  003722          JSR     PC,WRITLU       ;LOAD DATA INTO REG 11
005200  012737  000010  002400  MOV     #10,REGNUM      ;SET REG NO. = 10
005206  113737  002422  002366  MOVB    TXWORD,WRIBYT   ;SET DATA TO BE WRITTEN INTO REG 10
005214  004737  003722          JSR     PC,WRITLU       ;LOAD DATA INTO REG 10
005220  012637  002400          MOV     (SP)+,REGNUM    ;RESTORE LU REG NO.
005224  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.
                                ;*****************************************************************************
005226  010146          STPLU:  MOV     R1,-(SP)        ;SAVE R1
005230  017601  000002          MOV     @2(SP),R1       ;GET DESIRED NO. OF CYCLES
005234  001426                  BEQ     6$              ;IF DESIRED CYCLES = 0, RETURN
005236  100006                  BPL     2$              ;BR IF CHIP TYPE CHECK NOT NECESSARY
005240  042701  100000          BIC     #BIT15,R1       ;CLEAR FLAG BIT
005244  005737  002430          TST     CHPTYP          ;SEE IF SIG USYRT
005250  001401                  BEQ     2$              ;BR IF YES
005252  005301                  DEC     R1              ;DECREMENT CYCLE COUNT
005254  152777  000010  175166  2$:     BISB    #LULOOP,@BSEL1  ;SET LU LOOP BIT
005262  152777  000020  175160  3$:     BISB    #STEPLU,@BSEL1  ;SET THE STEPLU BIT (CLOCK THE TRANSMITTER)
005270  004737  005136          JSR     PC,STALL        ;STALL
005274  142777  000020  175146          BICB    #STEPLU,@BSEL1  ;CLEAR THE STEPLU BIT (CLOCK THE RECEIVER)
005302  004737  005136          JSR     PC,STALL        ;STALL
005306  005301                  DEC     R1              ;DECREMENT CYCLE COUNTER
005310  001364                  BNE     3$              ;BR IF NOT DONE YET
005312  062766  000002  000002  6$:     ADD     #2,2(SP)        ;FIX UP RETURN PC
005320  012601                  MOV     (SP)+,R1        ;RESTORE R1
005322  000207                  RTS     PC              ;RETURN
```

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                                        ;*****************************************************************************
                                        ;* 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.
                                        ;*****************************************************************************
005324  013746  002400          OACTIV: MOV     REGNUM,-(SP)    ;SAVE LU REG NO.
005330  013746  002352                  MOV     SUBRPC,-(SP)
005334  005737  002352                  TST     SUBRPC          ;SEE IF THIS IS A NESTED CALL
005340  001006                          BNE     1$              ;BR IF YES
005342  016637  000004  002352          MOV     4(SP),SUBRPC
005350  162737  000004  002352          SUB     #4,SUBRPC       ;GET PC OF SUBROUTINE CALL
005356  012737  000011  002400  1$:     MOV     #11,REGNUM      ;SET REG NO. = 11
005364  004737  003644                  JSR     PC,READLU       ;READ REG 11
005370  032776  000001  000004          BIT     #BIT0,@4(SP)    ;GET EXPECTED STATE OF OACT
005376  001413                          BEQ     3$              ;BR IF EXPECTED OACT = 0
005400  132737  000100  002364          BITB    #OACT,REDBYT    ;SEE IF OACT = 1
005406  001031                          BNE     9$              ;BR IF OACT = 1
005410  004737  004500                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                                ;REPORT OACT NOT SET
005414                                  ERRDF   11,EM11,ERR4
  (4)   005414  104455                                                  TRAP    C$ERDF
  (5)   005416  000013                                                  .WORD   11
  (5)   005420  012444                                                  .WORD   EM11
  (5)   005422  015576                                                  .WORD   ERR4
005424  000412                          BR      6$              ;TAKE ERROR RETURN
005426  132737  000100  002364  3$:     BITB    #OACT,REDBYT    ;SEE IF OACT = 0
005434  001416                          BEQ     9$              ;BR IF OACT = 0
005436  004737  004500                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                                ;REPORT OACT NOT CLEARED
005442                                  ERRDF   12,EM12,ERR4
  (4)   005442  104455                                                  TRAP    C$ERDF
  (5)   005444  000014                                                  .WORD   12
  (5)   005446  012461                                                  .WORD   EM12
  (5)   005450  015576                                                  .WORD   ERR4
005452  016637  000002  002400  6$:     MOV     2(SP),REGNUM    ;RESTORE LU REG NO.
005460  013706  002346                  MOV     PSTACK,SP       ;RESTORE PROGRAM STACK TO BASE LEVEL
005464  013746  002362                  MOV     RETADR,-(SP)    ;FIX UP ERROR RETURN PC
005470  000407                          BR      12$
005472  062766  000002  000004  9$:     ADD     #2,4(SP)        ;FIX UP ERROR-FREE RETURN PC
005500  012637  002352                  MOV     (SP)+,SUBRPC
005504  012637  002400                  MOV     (SP)+,REGNUM    ;RESTORE LU REG NO.
005510  000207                  12$:    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
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                                        ;*      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.
                                        ;*****************************************************************************
005512  010146                        INITRN: MOV     R1,-(SP)        ;SAVE R1
005514  013746  002400                        MOV     REGNUM,-(SP)    ;SAVE LU REG NO.
005520  013746  002402                        MOV     AXNUM,-(SP)     ;SAVE AX BYTE NO.
005524  016637  000006  002352                MOV     6(SP),SUBRPC
005532  162737  000004  002352                SUB     #4,SUBRPC       ;GET PC OF SUBR CALL
005540  004737  003576                        JSR     PC,MSTCLR       ;ISSUE A MASTER CLEAR
005544  004737  004634                        JSR     PC,OSIRDY       ;CHECK ORDY=1, OCOR=0
005550  000001                              1
005552  004737  005324                        JSR     PC,OACTIV       ;CHK OACT=0
005556  000000                              0
005560  012737  000004  002402                MOV     #4,AXNUM        ;SET AX BYTE NO. = 4 FOR AX2
005566  117637  000006  002374                MOVB    @6(SP),WAX15    ;SET DATA BYTE TO LOAD INTO AX2-15
005574  012737  000400  002422                MOV     #TXSOM,TXWORD   ;SET TSOM BIT
005602  113737  002374  002422                MOVB    WAX15,TXWORD    ;SET SYNCH CHAR
005610  005037  002376                        CLR     WAX16
005614  004737  004264                        JSR     PC,WRITAX       ;LOAD AX2
005620  012737  000017  002400                MOV     #17,REGNUM      ;SET REG NO. = 17
005626  062766  000002  000006                ADD     #2,6(SP)        ;INCR POINTER TO NEXT DATA BYTE
005634  117637  000006  002366                MOVB    @6(SP),WRIBYT   ;SET DATA BYTE TO LOAD INTO REG 17
005642  004737  003722                        JSR     PC,WRITLU       ;LOAD REG 17
005646  004737  005146                        JSR     PC,LDTXSI       ;LOAD THE SILO WITH SOM CHAR
005652  004737  005146                        JSR     PC,LDTXSI       ;LOAD ANOTHER SOM INTO SILO
005656  004737  005120                        JSR     PC,WAIT50       ;WAIT FOR DATA TO RIPPLE
005662  004737  004634                        JSR     PC,OSIRDY       ;CHK ORDY=1, OCOR=1
005666  000003                              3
005670  004737  005324                        JSR     PC,OACTIV       ;CHK FOR OACT = 0
005674  000000                              0
005676  005001                              CLR     R1              ;INIT CYCLE COUNTER
005700  012737  000011  002400                MOV     #11,REGNUM      ;SET LU REG NO. = 11
005706  152777  000010  174534  6$:           BISB    #LULOOP,@BSEL1  ;SET LINE UNIT LOOP BIT
005714  152777  000020  174526                BISB    #STEPLU,@BSEL1  ;SET CLOCK BIT
005722  004737  005136                        JSR     PC,STALL        ;STALL FOR MICRO-SEC
005726  004737  003644                        JSR     PC,READLU       ;READ REG 11
005732  132737  000100  002364                BITB    #OACT,REDBYT    ;SEE IF OACT = 1 YET
005740  001014                                BNE     9$              ;BR IF OACT = 1
005742  142777  000020  174500                BICB    #STEPLU,@BSEL1  ;CLEAR CLOCK BIT
005750  004737  005136                        JSR     PC,STALL        ;STALL FOR A MICRO-SEC
005754  005201                              INC     R1              ;INCR CYCLE COUNT
005756  020127  000003                        CMP     R1,#3           ;SEE IF 3 CYCLES DONE YET
005762  002751                              BLT     6$              ;BR IF NOT
005764  004737  005324                        JSR     PC,OACTIV       ;CHK FOR OACT = 1
005770  000001                              1
005772  012737  000017  002400  9$:           MOV     #17,REGNUM      ;SET REG NO. = 17
006000  005037  002430                        CLR     CHPTYP          ;CLEAR USYRT CHIP INDICATOR
006004  004737  003644                        JSR     PC,READLU       ;READ REG 17
006010  132737  000020  002364                BITB    #OCOR,REDBYT    ;CHK FOR OCOR CLEARED YET
006016  001403                                BEQ     12$             ;BR IF YES - IT IS SIG CHIP
006020  012737  000001  002430                MOV     #1,CHPTYP       ;SET INDICATOR FOR OTHER CHIP TYPE
006026  142777  000020  174414  12$:          BICB    #STEPLU,@BSEL1  ;CLEAR CLOCK BIT
006034  004737  005136                        JSR     PC,STALL        ;STALL FOR MICRO-SEC
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 6887  006040  004737  004634            JSR     PC,OSIRDY       ;CHK FOR ORDY = 1, OCOR = 0
 6888  006044  000001                    1
 6889  006046  062766  000002  000006    ADD     #2,6(SP)        ;FIX UP RETURN PC
 6890  006054  012637  002402            MOV     (SP)+,AXNUM     ;RESTORE AX BYTE NO.
 6891  006060  012637  002400            MOV     (SP)+,REGNUM    ;RESTORE LU REG NO.
 6892  006064  012601                    MOV     (SP)+,R1        ;RESTORE R1
 6893  006066  005037  002352            CLR     SUBRPC          ;CLEAR SUBR CALL PC
 6894  006072  000207                    RTS     PC              ;RETURN
 6895
 6896
 6897
 6898
 6899
 6900                                    ;*********************************************************************************
 6901                                    ;* TXCHAR - THIS SUBROUTINE INITIATES TRANSMISSION OF A CHARACTER, BY LOADING
 6902                                    ;*      THE TX SILO WITH DATA PASSED IN BITS 0-11 OF THE WORD FOLLOWING THE CALL
 6903                                    ;*      AND CLOCKS THE LINE UNIT WITH THE NUMBER OF CYCLES PASSED IN BITS 0-14
 6904                                    ;*      OF THE SECOND WORD FOLLOWING THE CALL. IF BIT 15 = 1, A CHK IS MADE TO
 6905                                    ;*      DETERMINE IF THE USYRT CHIP TYPE REQUIRES DECREMENTING THE NO. OF CYCLES
 6906                                    ;*      BY 1. THE PROGRAM CHECKS FOR VALID STATES OF ORDY,
 6907                                    ;*      OCOR, AND OACT THROUGHOUT THE PROCESS.
 6908                                    ;*      IF AN ERROR IS DETECTED, A RETURN IS MADE TO THE TEST, AT THE ADDRESS
 6909                                    ;*      CONTAINED IN RETADR.
 6910                                    ;*********************************************************************************
 6911  006074  010146            TXCHAR: MOV     R1,-(SP)        ;SAVE R1
 6912  006076  010246                    MOV     R2,-(SP)        ;SAVE R2
 6913  006100  016637  000004  002352    MOV     4(SP),SUBRPC
 6914  006106  162737  000004  002352    SUB     #4,SUBRPC       ;GET PC OF SUBR CALL
 6915  006114  017637  000004  002422    MOV     @4(SP),TXWORD   ;GET DATA TO BE TRANSMITTED
 6916  006122  004737  005146            JSR     PC,LDTXSI       ;LOAD THE TX SILO WITH THE DATA
 6917  006126  004737  005120            JSR     PC,WAIT50       ;WAIT FOR DATA TO RIPPLE DOWN SILO
 6918  006132  062766  000002  000004    ADD     #2,4(SP)        ;INCR POINTER
 6919  006140  005001                    CLR     R1              ;INIT CYCLE COUNT
 6920  006142  017602  000004            MOV     @4(SP),R2       ;GET DESIRED NO. OF CYCLES
 6921  006146  005702                    TST     R2              ;SEE IF CHIP TYPE CHK SHOULD BE MADE
 6922  006150  100006                    BPL     9$              ;BR IF NOT
 6923  006152  042702  100000            BIC     #BIT15,R2       ;CLEAR FLAG BIT
 6924  006156  005737  002430            TST     CHPTYP          ;SEE IF SIG USYRT
 6925  006162  001401                    BEQ     9$              ;BR IF YES
 6926  006164  005302                    DEC     R2              ;DECREMENT NO. OF CYCLES
 6927  006166  004737  005324      9$:   JSR     PC,OACTIV       ;CHK OACT = 1
 6928  006172  000001                    1
 6929  006174  020102                    CMP     R1,R2           ;SEE IF REQUIRED CYCLES DONE YET
 6930  006176  001410                    BEQ     12$             ;BR IF YES
 6931  006200  004737  004634            JSR     PC,OSIRDY       ;CHK ORDY=1, OCOR=1
 6932  006204  000003                    3
 6933  006206  004737  005226            JSR     PC,STPLU        ;STEP LU ONE CYCLE
 6934  006212  000001                    1
 6935  006214  005201                    INC     R1              ;INCR CYCLE COUNT
 6936  006216  000763                    BR      9$
 6937  006220  004737  004634     12$:   JSR     PC,OSIRDY       ;CHK ORDY=1, OCOR=0
 6938  006224  000001                    1
 6939  006226  062766  000002  000004    ADD     #2,4(SP)        ;FIX UP RETURN PC
 6940  006234  005037  002352            CLR     SUBRPC          ;CLEAR SUBR CALL PC
 6941  006240  012602                    MOV     (SP)+,R2        ;RESTORE R2
 6942  006242  012601                    MOV     (SP)+,R1        ;RESTORE R1
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 6943  006244  000207                          RTS     PC              ;RETURN
 6944
 6945
 6946
 6947
 6948
 6949                                  ;*****************************************************************************
 6950                                  ;* ENDTRN - THIS SUBROUTINE CLEARS THE TRANSMITTER BY SETTING OC. THE PROGRAM
 6951                                  ;*      WAITS FOR 50 US, AND CHECKS FOR ORDY=1, OCOR=0, OACT=0, RTS=0.
 6952                                  ;*****************************************************************************
 6953  006246  010146                  ENDTRN: MOV     R1,-(SP)        ;SAVE R1
 6954  006250  013746  002400                  MOV     REGNUM,-(SP)    ;SAVE LU REG NO.
 6955  006254  016637  000004  002352          MOV     4(SP),SUBRPC
 6956  006262  162737  000004  002352          SUB     #4,SUBRPC       ;GET PC OF SUBROUTINE CALL
 6957  006270  012737  000011  002400          MOV     #11,REGNUM      ;SET LU REG NO. = 11
 6958  006276  012737  000200  002366          MOV     #OC,WRIBYT      ;SET OC IN DATA
 6959  006304  004737  003722                  JSR     PC,WRITLU       ;SET OC IN REG 11
 6960  006310  004737  005120                  JSR     PC,WAIT50       ;STALL FOR >50 US.
 6961  006314  004737  004634                  JSR     PC,OSIRDY       ;CHK ORDY=1, OCOR=0
 6962  006320  000001                          1
 6963  006322  004737  005324                  JSR     PC,OACTIV       ;CHK OACT = 0
 6964  006326  000000                          0
 6965  006330  012737  000013  002400          MOV     #13,REGNUM      ;SET REG NO. = 13
 6966  006336  004737  003644                  JSR     PC,READLU       ;READ REG 13
 6967  006342  032737  000040  002364          BIT     #RTS,REDBYT     ;CHK FOR RTS = 0
 6968  006350  001406                          BEQ     3$              ;BR IF RTS = 0
 6969  006352  004737  004500                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
 6970                                  ;REPORT RTS NOT CLEARED
 6971  006356                                  ERRDF   65,EM65,ERR4
  (4)  006356  104455                                                                     TRAP    C$ERDF
  (5)  006360  000101                                                                     .WORD   65
  (5)  006362  014220                                                                     .WORD   EM65
  (5)  006364  015576                                                                     .WORD   ERR4
 6972  006366  005037  002352          3$:     CLR     SUBRPC          ;CLEAR SUBR CALL PC
 6973  006372  012637  002400                  MOV     (SP)+,REGNUM    ;RESTORE LU REG NO.
 6974  006376  012601                          MOV     (SP)+,R1        ;RESTORE R1
 6975  006400  000207                          RTS     PC              ;RETURN
 6976
 6977
 6978
 6979
 6980
 6981                                  ;*****************************************************************************
 6982                                  ;* ISIRDY - THIS SUBROUTINE CHECKS FOR THE PROPER STATES OF ICIR (REG 17)
 6983                                  ;*      AND IRDY (REG 12) AND REPORTS AN ERROR IF EITHER IS NOT PROPERLY SET
 6984                                  ;*      AS PASSED IN BIT 0 (ICIR) AND BIT 1 (IRDY) OF THE WORD FOLLOWING THE
 6985                                  ;*      CALL.
 6986                                  ;*      IF AN ERROR OCCURS, A RETURN IS MADE TO THE TEST AT THE ADDRESS
 6987                                  ;*      IN RETADR.
 6988                                  ;*****************************************************************************
 6989  006402  013746  002400          ISIRDY: MOV     REGNUM,-(SP)    ;SAVE LU REG NO.
 6990  006406  013746  002352                  MOV     SUBRPC,-(SP)
 6991  006412  005737  002352                  TST     SUBRPC          ;SEE IF THIS IS A NESTED CALL
 6992  006416  001006                          BNE     1$              ;BR IF YES
 6993  006420  016637  000004  002352          MOV     4(SP),SUBRPC
 6994  006426  162737  000004  002352          SUB     #4,SUBRPC       ;GET PC OF SUBR CALL
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 6995  006434  012737  000012  002400  1$:     MOV     #12,REGNUM      ;SET REG NO. TO 12
 6996  006442  004737  003644                  JSR     PC,READLU       ;READ REG 12
 6997  006446  032776  000002  000004          BIT     #BIT1,@4(SP)    ;GET EXPECTED STATE OF IRDY
 6998  006454  001413                          BEQ     3$              ;BR IF EXPECTED IRDY = 0
 6999  006456  132737  000020  002364          BITB    #IRDY,REDBYT    ;SEE IF IRDY = 1
 7000  006464  001022                          BNE     9$              ;BR IF IRDY = 1
 7001  006466  004737  004500                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
 7002                                  ;REPORT IRDY NOT SET
 7003  006472                                  ERRDF   17,EM17,ERR4
   (4) 006472  104455                                                              TRAP    C$ERDF
   (5) 006474  000021                                                              .WORD   17
   (5) 006476  012617                                                              .WORD   EM17
   (5) 006500  015576                                                              .WORD   ERR4
 7004  006502  000451                          BR      16$             ;TAKE ERROR EXIT
 7005  006504  132737  000020  002364  3$:     BITB    #IRDY,REDBYT    ;SEE IF IRDY = 0
 7006  006512  001407                          BEQ     9$              ;BR IF IRDY = 0
 7007  006514  004737  004500                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
 7008                                  ;REPORT IRDY NOT CLEARED
 7009  006520                                  ERRDF   18,EM18,ERR4
   (4) 006520  104455                                                              TRAP    C$ERDF
   (5) 006522  000022                                                              .WORD   18
   (5) 006524  012634                                                              .WORD   EM18
   (5) 006526  015576                                                              .WORD   ERR4
 7010  006530  000436                          BR      16$             ;TAKE ERROR RETURN
 7011  006532  012737  000017  002400  9$:     MOV     #17,REGNUM      ;SET REG NO. = 17
 7012  006540  004737  003644                  JSR     PC,READLU       ;READ REG 17
 7013  006544  132776  000001  000004          BITB    #BIT0,@4(SP)    ;GET EXPECTED STATE OF ICIR
 7014  006552  001413                          BEQ     12$             ;BR IF EXPECTED ICIR = 0
 7015  006554  132737  000010  002364          BITB    #ICIR,REDBYT    ;SEE IF ICIR = 1
 7016  006562  001031                          BNE     20$             ;BR IF ICIR = 1
 7017  006564  004737  004500                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
 7018                                  ;REPORT ICIR NOT SET
 7019  006570                                  ERRDF   19,EM19,ERR4
   (4) 006570  104455                                                              TRAP    C$ERDF
   (5) 006572  000023                                                              .WORD   19
   (5) 006574  012655                                                              .WORD   EM19
   (5) 006576  015576                                                              .WORD   ERR4
 7020  006600  000412                          BR      16$             ;TAKE ERROR RETURN
 7021  006602  132737  000010  002364  12$:    BITB    #ICIR,REDBYT    ;SEE IF ICIR = 0
 7022  006610  001416                          BEQ     20$             ;BR IF ICIR = 0
 7023  006612  004737  004500                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
 7024                                  ;REPORT ICIR NOT CLEARED
 7025  006616                                  ERRDF   20,EM20,ERR4
   (4) 006616  104455                                                              TRAP    C$ERDF
   (5) 006620  000024                                                              .WORD   20
   (5) 006622  012672                                                              .WORD   EM20
   (5) 006624  015576                                                              .WORD   ERR4
 7026  006626  016637  000002  002400  16$:    MOV     2(SP),REGNUM    ;RESTORE LU REG NO.
 7027  006634  013706  002346                  MOV     PSTACK,SP       ;RESTORE STACK POINTER TO BASE LEVEL
 7028  006640  013746  002362                  MOV     RETADR,-(SP)    ;FIX ERROR RETURN PC
 7029  006644  000407                          BR      23$
 7030  006646  062766  000002  000004  20$:    ADD     #2,4(SP)        ;FIX UP ERROR-FREE RETURN PC
 7031  006654  012637  002352                  MOV     (SP)+,SUBRPC
 7032  006660  012637  002400                  MOV     (SP)+,REGNUM    ;RESTORE LU REG NO.
 7033  006664  000207                  23$:    RTS     PC              ;RETURN
 7034
```

```
                                        ;*****************************************************************************
                                        ;* 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
                                        ;*      WORD FOLLOWING THE CALL.
                                        ;*      IF AN ERROR OCCURS, A RETURN IS MADE TO THE TEST AT THE ADDRESS IN
                                        ;*      RETADR.
                                        ;*****************************************************************************
006666  013746  002400          IACTIV: MOV     REGNUM,-(SP)    ;SAVE LU REG NO.
006672  013746  002352                  MOV     SUBRPC,-(SP)
006676  005737  002352                  TST     SUBRPC          ;SEE IF THIS IS A NESTED CALL
006702  001006                          BNE     1$              ;BR IF YES
006704  016637  000004  002352          MOV     4(SP),SUBRPC
006712  162737  000004  002352          SUB     #4,SUBRPC       ;GET PC OF SUBR CALL
006720  012737  000012  002400  1$:     MOV     #12,REGNUM      ;SET REG NO. = 12
006726  004737  003644                  JSR     PC,READLU       ;READ REG 12
006732  032776  000001  000004          BIT     #BIT0,@4(SP)    ;GET EXPECTED STATE OF IACT
006740  001413                          BEQ     3$              ;BR IF EXPECTED IACT = 0
006742  132737  000100  002364          BITB    #IACT,REDBYT    ;SEE IF IACT = 1
006750  001031                          BNE     9$              ;BR IF IACT = 1
006752  004737  004500                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                                ;REPORT IACT NOT SET
006756                                  ERRDF   21,EM21,ERR4
(4)  006756  104455                                                     TRAP    C$ERDF
(5)  006760  000025                                                     .WORD   21
(5)  006762  012713                                                     .WORD   EM21
(5)  006764  015576                                                     .WORD   ERR4
006766  000412                          BR      6$              ;TAKE ERROR EXIT
006770  132737  000100  002364  3$:     BITB    #IACT,REDBYT    ;SEE IF IACT = 0
006776  001416                          BEQ     9$              ;BR IF IACT = 0
007000  004737  004500                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                                ;REPORT IACT NOT CLEARED
007004                                  ERRDF   22,EM22,ERR4
(4)  007004  104455                                                     TRAP    C$ERDF
(5)  007006  000026                                                     .WORD   22
(5)  007010  012730                                                     .WORD   EM22
(5)  007012  015576                                                     .WORD   ERR4
007014  016637  000002  002400  6$:     MOV     2(SP),REGNUM    ;RESTORE LU REG NO.
007022  013706  002346                  MOV     PSTACK,SP       ;RESTORE PROGRAM STACK TO BASE LEVEL
007026  013746  002362                  MOV     RETADR,-(SP)    ;FIX UP ERROR RETURN PC
007032  000407                          BR      12$
007034  062766  000002  000004  9$:     ADD     #2,4(SP)        ;FIX UP ERROR-FREE RETURN PC
007042  012637  002352                  MOV     (SP)+,SUBRPC
007046  012637  002400                  MOV     (SP)+,REGNUM    ;RESTORE LU REG NO.
007052  000207                  12$:    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
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                                        ;* 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.
                                        ;*****************************************************************************
007054  013746  002402        RSEOM:  MOV     AXNUM,-(SP)     ;SAVE AX BYTE NO.
007060  013746  002352                MOV     SUBRPC,-(SP)
007064  005737  002352                TST     SUBRPC          ;SEE IF THIS IS A NESTED CALL
007070  001006                        BNE     1$              ;BR IF YES
007072  016637  000004  002352        MOV     4(SP),SUBRPC
007100  162737  000004  002352        SUB     #4,SUBRPC       ;GET PC OF SUBR CALL
007106  012737  000001  002402  1$:   MOV     #1,AXNUM        ;SET AX BYTE NO. FOR AX0-16
007114  004737  004076                JSR     PC,READAX       ;READ AX0
007120  032776  000001  000004        BIT     #BIT0,@4(SP)    ;GET EXPECTED STATE OF RSOM
007126  001413                        BEQ     3$              ;BR IF EXPECTED RSOM = 0
007130  132737  000001  002372        BITB    #RSOM,RAX16     ;SEE IF RSOM = 1
007136  001022                        BNE     9$              ;BR IF RSOM = 1
007140  004737  004500                JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                                ;REPORT RSOM NOT SET
007144                                  ERRDF   29,EM29,ERR6
 (4)    007144  104455                                                  TRAP    C$ERDF
 (5)    007146  000035                                                  .WORD   29
 (5)    007150  013147                                                  .WORD   EM29
 (5)    007152  016766                                                  .WORD   ERR6
007154  000444                        BR      16$             ;TAKE ERROR EXIT
007156  132737  000001  002372  3$:   BITB    #RSOM,RAX16     ;SEE IF RSOM = 0
007164  001407                        BEQ     9$              ;BR IF RSOM = 0
007166  004737  004500                JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                                ;REPORT RSOM NOT CLEARED
007172                                  ERRDF   28,EM28,ERR6
 (4)    007172  104455                                                  TRAP    C$ERDF
 (5)    007174  000034                                                  .WORD   28
 (5)    007176  013126                                                  .WORD   EM28
 (5)    007200  016766                                                  .WORD   ERR6
007202  000431                        BR      16$             ;TAKE ERROR RETURN
007204  132776  000002  000004  9$:   BITB    #BIT1,@4(SP)    ;GET EXPECTED STATE OF REOM
007212  001413                        BEQ     12$             ;BR IF EXPECTED REOM = 0
007214  132737  000002  002372        BITB    #REOM,RAX16     ;SEE IF REOM = 1
007222  001031                        BNE     20$             ;BR IF REOM = 1
007224  004737  004500                JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                                ;REPORT REOM NOT SET
007230                                  ERRDF   31,EM31,ERR6
 (4)    007230  104455                                                  TRAP    C$ERDF
 (5)    007232  000037                                                  .WORD   31
 (5)    007234  013205                                                  .WORD   EM31
 (5)    007236  016766                                                  .WORD   ERR6
007240  000412                        BR      16$             ;TAKE ERROR RETURN
007242  132737  000002  002372  12$:  BITB    #REOM,RAX16     ;SEE IF REOM = 0
007250  001416                        BEQ     20$             ;BR IF REOM = 0
007252  004737  004500                JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                                ;REPORT REOM NOT CLEARED
007256                                  ERRDF   30,EM30,ERR6
 (4)    007256  104455                                                  TRAP    C$ERDF
 (5)    007260  000036                                                  .WORD   30
 (5)    007262  013164                                                  .WORD   EM30
 (5)    007264  016766                                                  .WORD   ERR6
007266  016637  000002  002402  16$:  MOV     2(SP),AXNUM     ;RESTORE AX BYTE NO.
007274  013706  002346                MOV     PSTACK,SP       ;RESTORE STACK POINTER TO BASE LEVEL
```

```
7123  007300  013746  002362                  MOV     RETADR,-(SP)    ;FIX ERROR RETURN PC
7124  007304  000407                          BR      23$
7125  007306  062766  000002  000004  20$:    ADD     #2,4(SP)        ;FIX UP ERROR-FREE RETURN PC
7126  007314  012637  002352                  MOV     (SP)+,SUBRPC
7127  007320  012637  002402                  MOV     (SP)+,AXNUM     ;RESTORE AX BYTE NO.
7128  007324  000207                  23$:    RTS     PC              ;RETURN
7129
7130
7131
7132
7133
7134                                  ;*****************************************************************************
7135                                  ;* RDRXSI - THIS SUBROUTINE READS THE RCV SILO (REGS 10,12) AND RETURNS THE
7136                                  ;*      SILO ENTRY IN BITS 0-11 OF RXWORD.
7137                                  ;*****************************************************************************
7138  007326  013746  002400          RDRXSI: MOV     REGNUM,-(SP)    ;SAVE LU REG NO.
7139  007332  012737  000012  002400          MOV     #12,REGNUM      ;SET REG NO. = 12
7140  007340  004737  003644                  JSR     PC,READLU       ;READ LU REG 12
7141  007344  113737  002364  002425          MOVB    REDBYT,RXWORD+1 ;GET HI BITS OF SILO ENTRY
7142  007352  042737  170000  002424          BIC     #170000,RXWORD  ;CLEAR UNUSED BITS
7143  007360  012737  000010  002400          MOV     #10,REGNUM      ;SET REG NO. = 10
7144  007366  004737  003644                  JSR     PC,READLU       ;READ REG 10
7145  007372  113737  002364  002424          MOVB    REDBYT,RXWORD   ;GET LOW BITS OF SILO ENTRY
7146  007400  012637  002400                  MOV     (SP)+,REGNUM    ;RESTORE LU REG NO.
7147  007404  000207                          RTS     PC              ;RETURN
7148
7149
7150
7151
7152
7153                                  ;*****************************************************************************
7154                                  ;* RCV1ST - THIS SUBROUTINE RECEIVES THE FIRST CHAR OF A MESSAGE, AND MONITORS
7155                                  ;*      STATUS OF THE RECEIVER. FIRST, A CHECK IS MADE FOR IACT = 0, IRDY = 0,
7156                                  ;*      ICIR = 1, AND RSOM = 0. THEN, THE LINE UNIT IS CLOCKED USING
7157                                  ;*      STEPLU UNTIL IRDY = 1. THE PROGRAM CHECKS FOR THIS TO OCCUR WITHIN 3
7158                                  ;*      CYCLES AFTER THE NO. OF CYCLES PASSED IN THE WORD FOLLOWING THE CALL.
7159                                  ;*      IF AN ERROR OCCURS, A RETURN IS MADE TO THE TEST, AT THE ADDRESS
7160                                  ;*      CONTAINED IN RETADR.
7161                                  ;*****************************************************************************
7162  007406  010146                  RCV1ST: MOV     R1,-(SP)        ;SAVE R1
7163  007410  010346                          MOV     R3,-(SP)        ;SAVE R3
7164  007412  013746  002400                  MOV     REGNUM,-(SP)    ;SAVE LU REG NO.
7165  007416  016637  000006  002352          MOV     6(SP),SUBRPC
7166  007424  162737  000004  002352          SUB     #4,SUBRPC       ;GET PC OF SUBROUTINE CALL
7167  007432  012737  000012  002400          MOV     #12,REGNUM      ;SET LU REG NO. = 12
7168  007440  005001                          CLR     R1              ;INIT CYCLE COUNT TO 0
7169  007442  017603  000006                  MOV     @6(SP),R3       ;GET CYCLE COUNT LIMIT
7170  007446  062703  000003                  ADD     #3,R3
7171  007452  005776  000006                  TST     @6(SP)          ;SEE IF DESIRED CYCLES = 0
7172  007456  001414                          BEQ     8$              ;BR IF YES
7173  007460  004737  006666                  JSR     PC,IACTIV       ;CHK FOR IACT = 0
7174  007464  000000                          0
7175  007466  004737  006402                  JSR     PC,ISIRDY       ;CHK FOR ICIR = 1, IRDY = 0
7176  007472  000001                          1
7177  007474  004737  007054                  JSR     PC,RSEOM        ;CHK RSOM = 0, REOM = 0 IN AX0-16
7178  007500  000000                          0
```

```
7179  007502  004737  005226          6$:   JSR     PC,STPLU        ;CLOCK LU FOR 1 CYCLE
7180  007506  000001                        1
7181  007510  004737  005120          8$:   JSR     PC,WAIT50       ;ALLOW SILO DATA TO RIPPLE
7182  007514  005201                        INC     R1              ;INCREMENT CYCLE COUNT
7183  007516  004737  003644                JSR     PC,READLU       ;READ REG 12
7184  007522  132737  000020  002364        BITB    #IRDY,REDBYT    ;SEE IF IRDY = 1 YET
7185  007530  001005                        BNE     9$              ;BR IF IRDY = 1
7186  007532  020103                        CMP     R1,R3           ;SEE IF LIMIT EXCEEDED
7187  007534  002762                        BLT     6$              ;BR IF NOT YET
7188  007536  004737  006402                JSR     PC,ISIRDY       ;CHK FOR ICIR = 1, IRDY = 1
7189  007542  000003                        3
7190  007544  020176  000006          9$:   CMP     R1,@6(SP)       ;SEE IF LESS THAN REQUIRED CYCLES
7191  007550  002003                        BGE     12$             ;BR IF NOT
7192  007552  004737  006402                JSR     PC,ISIRDY       ;CHK FOR ICIR = 1, IRDY = 0
7193  007556  000001                        1
7194  007560  004737  006666          12$:  JSR     PC,IACTIV       ;CHK FOR IACT = 1
7195  007564  000001                        1
7196  007566  004737  006402                JSR     PC,ISIRDY       ;CHK FOR ICIR = 1, IRDY = 1
7197  007572  000003                        3
7198  007574  062766  000002  000006        ADD     #2,6(SP)        ;FIX UP RETURN PC
7199  007602  012637  002400                MOV     (SP)+,REGNUM    ;RESTORE LU REG NO.
7200  007606  012603                        MOV     (SP)+,R3        ;RESTORE R3
7201  007610  012601                        MOV     (SP)+,R1        ;RESTORE R1
7202  007612  005037  002352                CLR     SUBRPC          ;CLEAR SUBR CALL PC
7203  007616  000207                        RTS     PC              ;RETURN
7204
7205
7206
7207
7208
7209                                  ;*****************************************************************************
7210                                  ;* STPERR - THIS SUBROUTINE LOADS THE CONTENTS OF THE FIRST WORD FOLLOWING THE
7211                                  ;*      CALL INTO REG 17, AND SETS THE IERR BIT, AND CLOCKS THE LINE UNIT
7212                                  ;*      FOR THE NO. OF CYCLES PASSED IN THE 2ND WORD FOLLOWING THE CALL. THEN,
7213                                  ;*      IT RESTORES REG 17 TO ITS ORIGINAL CONTENTS, CLEARING THE IERR BIT.
7214                                  ;*****************************************************************************
7215  007620  013746  002400          STPERR: MOV     REGNUM,-(SP)    ;SAVE LU REG NO.
7216  007624  012737  000017  002400          MOV     #17,REGNUM      ;SET LU REG NO. = 17
7217  007632  017637  000002  002366          MOV     @2(SP),WRIBYT
7218  007640  152737  000002  002366          BISB    #IERR,WRIBYT
7219  007646  004737  003722                  JSR     PC,WRITLU       ;SET IERR BIT IN REG 17
7220  007652  062766  000002  000002          ADD     #2,2(SP)        ;INCREMENT SUBR ARGUMENT POINTER
7221  007660  017637  000002  007672          MOV     @2(SP),3$       ;GET DESIRED NO. OF CYCLES
7222  007666  004737  005226                  JSR     PC,STPLU        ;CLOCK LU FOR DESIRED NO. OF CYCLES
7223  007672  000000                  3$:     .WORD   0               ;NO. OF CYCLES GOES HERE
7224  007674  142737  000002  002366          BICB    #IERR,WRIBYT
7225  007702  004737  003722                  JSR     PC,WRITLU       ;CLEAR IERR BIT IN REG 17
7226  007706  062766  000002  000002          ADD     #2,2(SP)        ;FIX UP RETURN PC
7227  007714  012637  002400                  MOV     (SP)+,REGNUM    ;RESTORE LU REG NO.
7228  007720  000207                          RTS     PC              ;RETURN
7229
7230
7231
7232
7233
7234                                  ;*****************************************************************************
```

```
                                        ;* CKDATA - THIS SUBROUTINE READS THE RCV SILO AND COMPARES THE SILO ENTRY
                                        ;*      TO BITS 0-11 OF THE FIRST WORD FOLLOWING THE CALL. IF THERE IS A
                                        ;*      MISMATCH, THE ERROR IS REPORTED AND A RETURN IS MADE TO THE TEST AT THE
                                        ;*      ADDRESS CONTAINED IN RETADR. IF BIT 15 = 0 IN THE FIRST WORD
                                        ;*      FOLLOWING THE CALL, THE SUBROUTINE WILL NOT CHECK THE BCC BIT (SILO
                                        ;*      BIT 8). IF THERE ARE NO ERRORS, THE LINE UNIT IS CLOCKED FOR THE
                                        ;*      NUMBER OF CYCLES PASSED IN THE SECOND WORD FOLLOWING THE CALL.
                                        ;*****************************************************************************
007722  010146                  CKDATA: MOV     R1,-(SP)        ;SAVE R1
007724  013746  002400                  MOV     REGNUM,-(SP)    ;SAVE LU REG NO.
007730  016637  000004  002352          MOV     4(SP),SUBRPC
007736  162737  000004  002352          SUB     #4,SUBRPC       ;GET PC OF SUBR CALL
007744  017601  000004                  MOV     @4(SP),R1       ;GET EXPECTED SILO ENTRY
007750  042701  170000                  BIC     #170000,R1      ;CLEAR UNUSED BITS FOR COMPARE
007754  004737  007326                  JSR     PC,RDRXSI       ;READ RCV SILO
007760  023727  002432  000347          CMP     SAVLEN,#TXLEN2!TXLEN1!TXLEN0!RXLEN2!RXLEN1!RXLEN0
007766  001005                          BNE     4$              ;BR IF CHAR LENGTH NOT = 7
007770  042701  000200                  BIC     #BIT7,R1        ;MASK OFF BIT 8TH BIT
007774  042737  000200  002424          BIC     #BIT7,RXWORD
010002  120137  002424          4$:     CMPB    R1,RXWORD       ;COMPARE EXPECTED BITS 0-7 TO ACTUAL
010006  001445                          BEQ     6$              ;BR IF MATCH
010010  005037  002404                  CLR     GOODAT
010014  110137  002404                  MOVB    R1,GOODAT       ;GET EXPECTED DATA
010020  005037  002406                  CLR     BADDAT
010024  113737  002424  002406          MOVB    RXWORD,BADDAT   ;GET ACTUAL DATA
010032  012737  000011  002400          MOV     #11,REGNUM      ;SET REG NO. = 11
010040  004737  003644                  JSR     PC,READLU       ;READ REG 11
010044  132737  000001  002364          BITB    #UNRR,REDBYT    ;SEE IF TX UNDERRUN ERROR
010052  001410                          BEQ     5$              ;BR IF NOT
010054  004737  004500                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                        ;REPORT TX UNDERRUN ERROR
010060                                  ERRDF   54,EM54,ERR4
(4)  010060  104455                                                     TRAP    C$ERDF
(5)  010062  000066                                                     .WORD   54
(5)  010064  014162                                                     .WORD   EM54
(5)  010066  015576                                                     .WORD   ERR4
010070  000137  010552                  JMP     36$             ;TAKE ERROR EXIT
010074  012737  000010  002400  5$:     MOV     #10,REGNUM      ;SET REG NO. = 10
010102  004737  004500                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                        ;REPORT RCV'D DATA MISCOMPARE
010106                                  ERRDF   34,EM34,ERR8
(4)  010106  104455                                                     TRAP    C$ERDF
(5)  010110  000042                                                     .WORD   34
(5)  010112  013274                                                     .WORD   EM34
(5)  010114  020076                                                     .WORD   ERR8
010116  000137  010552                  JMP     36$             ;TAKE ERROR EXIT
010122  000301                  6$:     SWAB    R1
010124  012737  000012  002400          MOV     #12,REGNUM      ;SET LU REG NO. FOR ERROR REPORTS
010132  120137  002425                  CMPB    R1,RXWORD+1     ;COMPARE EXPECTED SILO BITS 8-11 TO ACTUAL
010136  001002                          BNE     7$              ;BR IF MISMATCH
010140  000137  010526                  JMP     22$             ;CONTINUE
010144  005037  002404          7$:     CLR     GOODAT
010150  110137  002404                  MOVB    R1,GOODAT       ;SET EXPECTED DATA
010154  005037  002406                  CLR     BADDAT
010160  113737  002425  002406          MOVB    RXWORD+1,BADDAT ;SET ACTUAL DATA
010166  032776  100000  000004          BIT     #BCCCHK,@4(SP)  ;SEE IF BCC SHOULD BE IGNORED
```

```
 7283  010174  001433                        BEQ     10$             ;BR IF YES
 7284  010176  132701  000001                BITB    #BCC,R1         ;SEE IF EXPECTED BIT = 1
 7285  010202  001014                        BNE     8$              ;BR IF YES
 7286  010204  132737  000001  002425        BITB    #BCC,RXWORD+1   ;SEE IF ACTUAL BIT = 0
 7287  010212  001424                        BEQ     10$             ;BR IF YES
 7288  010214  004737  004500                JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
 7289                                ;REPORT BCC NOT CLEARED
 7290  010220                              ERRDF   35,EM35,ERR8
   (4) 010220  104455                                                          TRAP    C$ERDF
   (5) 010222  000043                                                          .WORD   35
   (5) 010224  013322                                                          .WORD   EM35
   (5) 010226  020076                                                          .WORD   ERR8
 7291  010230  000137  010552                JMP     36$             ;TAKE ERROR EXIT
 7292  010234  132737  000001  002425  8$:   BITB    #BCC,RXWORD+1   ;SEE IF ACTUAL BIT = 1
 7293  010242  001010                        BNE     10$             ;BR IF YES
 7294  010244  004737  004500                JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
 7295                                ;REPORT BCC NOT SET
 7296  010250                              ERRDF   36,EM36,ERR8
   (4) 010250  104455                                                          TRAP    C$ERDF
   (5) 010252  000044                                                          .WORD   36
   (5) 010254  013342                                                          .WORD   EM36
   (5) 010256  020076                                                          .WORD   ERR8
 7297  010260  000137  010552                JMP     36$             ;TAKE ERROR EXIT
 7298  010264                        10$:
 7299  010264  132701  000002                BITB    #EBLK,R1        ;SEE IF EXPECTED BIT = 1
 7300  010270  001014                        BNE     12$             ;BR IF YES
 7301  010272  132737  000002  002425        BITB    #EBLK,RXWORD+1  ;SEE IF ACTUAL BIT = 0
 7302  010300  001424                        BEQ     14$             ;BR IF YES
 7303  010302  004737  004500                JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
 7304                                ;REPORT EBLK NOT CLEARED
 7305  010306                              ERRDF   37,EM37,ERR8
   (4) 010306  104455                                                          TRAP    C$ERDF
   (5) 010310  000045                                                          .WORD   37
   (5) 010312  013356                                                          .WORD   EM37
   (5) 010314  020076                                                          .WORD   ERR8
 7306  010316  000137  010552                JMP     36$             ;TAKE ERROR EXIT
 7307  010322  132737  000002  002425  12$:   BITB    #EBLK,RXWORD+1  ;SEE IF ACTUAL BIT = 1
 7308  010330  001010                        BNE     14$             ;BR IF YES
 7309  010332  004737  004500                JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
 7310                                ;REPORT EBLK NOT SET
 7311  010336                              ERRDF   38,EM38,ERR8
   (4) 010336  104455                                                          TRAP    C$ERDF
   (5) 010340  000046                                                          .WORD   38
   (5) 010342  013377                                                          .WORD   EM38
   (5) 010344  020076                                                          .WORD   ERR8
 7312  010346  000137  010552                JMP     36$             ;TAKE ERROR EXIT
 7313  010352                        14$:
 7314  010352  132701  000004                BITB    #RAB,R1         ;SEE IF EXPECTED BIT = 1
 7315  010356  001014                        BNE     16$             ;BR IF YES
 7316  010360  132737  000004  002425        BITB    #RAB,RXWORD+1   ;SEE IF ACTUAL BIT = 0
 7317  010366  001424                        BEQ     18$             ;BR IF YES
 7318  010370  004737  004500                JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
 7319                                ;REPORT RAB NOT CLEARED
 7320  010374                              ERRDF   39,EM39,ERR8
   (4) 010374  104455                                                          TRAP    C$ERDF
   (5) 010376  000047                                                          .WORD   39
```

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  (5)  010400  013414                                                                    .WORD   EM39
  (5)  010402  020076                                                                    .WORD   ERR8
7321   010404  000137  010552                    JMP     36$             ;TAKE ERROR EXIT
7322   010410  132737  000004  002425  16$:      BITB    #RAB,RXWORD+1   ;SEE IF ACTUAL BIT = 1
7323   010416  001010                            BNE     18$             ;BR IF YES
7324   010420  004737  004500                    JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
7325                          ;REPORT RAB NOT SET
7326   010424                                    ERRDF   40,EM40,ERR8
  (4)  010424  104455                                                                    TRAP    C$ERDF
  (5)  010426  000050                                                                    .WORD   40
  (5)  010430  013434                                                                    .WORD   EM40
  (5)  010432  020076                                                                    .WORD   ERR8
7327   010434  000137  010552                    JMP     36$             ;TAKE ERROR EXIT
7328   010440                          18$:
7329   010440  132701  000010                    BITB    #OVRR,R1        ;SEE IF EXPECTED BIT = 1
7330   010444  001014                            BNE     20$             ;BR IF YES
7331   010446  132737  000010  002425            BITB    #OVRR,RXWORD+1  ;SEE IF ACTUAL BIT = 0
7332   010454  001424                            BEQ     22$             ;BR IF YES
7333   010456  004737  004500                    JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
7334                          ;REPORT OVRR NOT CLEARED
7335   010462                                    ERRDF   41,EM41,ERR8
  (4)  010462  104455                                                                    TRAP    C$ERDF
  (5)  010464  000051                                                                    .WORD   41
  (5)  010466  013450                                                                    .WORD   EM41
  (5)  010470  020076                                                                    .WORD   ERR8
7336   010472  000137  010552                    JMP     36$             ;TAKE ERROR EXIT
7337   010476  132737  000010  002425  20$:      BITB    #OVRR,RXWORD+1  ;SEE IF ACTUAL BIT = 1
7338   010504  001010                            BNE     22$             ;BR IF YES
7339   010506  004737  004500                    JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
7340                          ;REPORT OVRR NOT SET
7341   010512                                    ERRDF   42,EM42,ERR8
  (4)  010512  104455                                                                    TRAP    C$ERDF
  (5)  010514  000052                                                                    .WORD   42
  (5)  010516  013471                                                                    .WORD   EM42
  (5)  010520  020076                                                                    .WORD   ERR8
7342   010522  000137  010552                    JMP     36$             ;TAKE ERROR EXIT
7343   010526                          22$:
7344   010526  062766  000002  000004            ADD     #2,4(SP)        ;INCR SUBROUTINE ARGUMENT POINTER
7345   010534  017637  000004  010546            MOV     @4(SP),24$      ;GET DESIRED CYCLE COUNT
7346   010542  004737  005226                    JSR     PC,STPLU        ;CLOCK LU FOR DESIRED CYCLES
7347   010546  000000                  24$:      .WORD   0
7348   010550  000407                            BR      38$             ;TAKE ERROR-FREE EXIT
7349   010552  011637  002400          36$:      MOV     (SP),REGNUM     ;RESTORE LU REG NO.
7350   010556  013706  002346                    MOV     PSTACK,SP       ;RESTORE PROGRAM STACK TO BASE LEVEL
7351   010562  013746  002362                    MOV     RETADR,-(SP)    ;FIX UP ERROR RETURN PC
7352   010566  000406                            BR      40$
7353   010570  062766  000002  000004  38$:      ADD     #2,4(SP)        ;FIX UP ERROR-FREE RETURN PC
7354   010576  012637  002400                    MOV     (SP)+,REGNUM    ;RESTORE LU REG NO.
7355   010602  012601                            MOV     (SP)+,R1        ;RESTORE R1
7356   010604  005037  002352          40$:      CLR     SUBRPC          ;CLEAR SUBROUTINE PC
7357   010610  000207                            RTS     PC              ;RETURN
7358
7359
7360
7361
7362
```

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                        ;*************************************************************************
                        ;* 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.
                        ;*************************************************************************
010612  013746  002402  SETUP:  MOV     AXNUM,-(SP)     ;SAVE AX BYTE NO.
010616  013746  002400          MOV     REGNUM,-(SP)    ;SAVE LU REG NO.
010622  012737  000004  002402  MOV     #4,AXNUM        ;SET AX BYTE NO. FOR AX2
010630  017637  000004  002374  MOV     @4(SP),WAX15
010636  005037  002376          CLR     WAX16
010642  004737  004264          JSR     PC,WRITAX       ;SET SYNCH CHAR IN AX2-15, CLEAR AX2-16
010646  012737  000017  002400  MOV     #17,REGNUM      ;SET LU REG NO. = 17
010654  062766  000002  000004  ADD     #2,4(SP)        ;INCREMENT ARGUMENT POINTER
010662  017637  000004  002366  MOV     @4(SP),WRIBYT
010670  004737  003722          JSR     PC,WRITLU       ;LOAD REG 17
010674  012737  000006  002402  MOV     #6,AXNUM        ;SET AX BYTE NO. FOR AX3
010702  062766  000002  000004  ADD     #2,4(SP)        ;INCREMENT ARGUMENT POINTER
010710  017637  000004  002374  MOV     @4(SP),WAX15
010716  062766  000002  000004  ADD     #2,4(SP)        ;INCR ARGUMENT POINTER
010724  017637  000004  002376  MOV     @4(SP),WAX16
010732  013737  002376  002432  MOV     WAX16,SAVLEN    ;STORE TX AND RCV CHAR LENGTH
010740  004737  004264          JSR     PC,WRITAX       ;LOAD AX3-15, AX3-16
010744  062766  000002  000004  ADD     #2,4(SP)        ;FIX RETURN PC
010752  012637  002400          MOV     (SP)+,REGNUM    ;RESTORE LU REG NO.
010756  012637  002402          MOV     (SP)+,AXNUM     ;RESTORE AX BYTE NO.
010762  005037  002352          CLR     SUBRPC          ;CLEAR SUBROUTINE PC STORAGE
010766  000207                  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.
                        ;*************************************************************************
010770  010146  LODMSG: MOV     R1,-(SP)        ;SAVE R1
010772  010246          MOV     R2,-(SP)        ;SAVE R2
010774  017601  000004  MOV     @4(SP),R1       ;GET MSG POINTER INTO R1
011000  062766  000002  000004  ADD     #2,4(SP)        ;INCR ARG POINTER
011006  017602  000004          MOV     @4(SP),R2       ;GET WORD COUNT INTO R2
011012  062766  000002  000004  ADD     #2,4(SP)        ;FIX UP RETURN PC
011020  012137  002422  6$:     MOV     (R1)+,TXWORD    ;GET NEXT MSG WORD
011024  004737  005146          JSR     PC,LDTXSI       ;LOAD A WORD INTO TX SILO
011030  005302                  DEC     R2              ;DECR COUNT
011032  001372                  BNE     6$              ;BR IF NOT DONE YET
011034  004737  005120          JSR     PC,WAIT50       ;WAIT FOR SILO TO RIPPLE
011040  012602                  MOV     (SP)+,R2        ;RESTORE R2
011042  012601                  MOV     (SP)+,R1        ;RESTORE R1
011044  000207                  RTS     PC              ;RETURN
```

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                                        ;*************************************************************************
                                        ;* 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. IT 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.
                                        ;*************************************************************************
011046  010146                  RXCHAR: MOV     R1,-(SP)        ;SAVE R1
011050  016637  000002  002352          MOV     2(SP),SUBRPC
011056  162737  000004  002352          SUB     #4,SUBRPC       ;GET PC OF SUBR CALL
011064  004737  007326                  JSR     PC,RDRXSI       ;READ RCV SILO
011070  004737  005120                  JSR     PC,WAIT50       ;ALLOW SILO TO RIPPLE
011074  005001                          CLR     R1              ;INIT CYCLE COUNT
011076  020176  000002          9$:     CMP     R1,@2(SP)       ;SEE IF REQUIRED CYCLES DONE YET
011102  001410                          BEQ     12$             ;BR IF YES
011104  004737  006402                  JSR     PC,ISIRDY       ;CHK ICIR = 1, IRDY = 0
011110  000001                          1
011112  004737  005226                  JSR     PC,STPLU        ;CLK LU 1 CYCLE
011116  000001                          1
011120  005201                          INC     R1              ;INCR CYCLE COUNT
011122  000765                          BR      9$
011124  004737  006402          12$:    JSR     PC,ISIRDY       ;CHK ICIR = 1 IRDY = 1
011130  000003                          3
011132  062766  000002  000002          ADD     #2,2(SP)        ;FIX RETURN PC
011140  005037  002352                  CLR     SUBRPC          ;CLEAR SUBR CALL PC
011144  012601                          MOV     (SP)+,R1        ;RESTORE R1
011146  000207                          RTS     PC              ;RETURN


                                        ;*************************************************************************
                                        ;* CKTBIT - THIS SUBROUTINE CLOCKS THE LINE UNIT FOR 8 CYCLES, AND AFTER EACH
                                        ;*      CYCLE, THE TXDATA BIT IN REG 17 IS EXAMINED, AND COMPARED TO A BIT OF
                                        ;*      THE CHAR PASSED IN THE WORD FOLLOWING THE CALL.
                                        ;*      IF AN ERROR OCCURS, A RETURN IS MADE TO THE TEST AT THE ADDRESS IN
                                        ;*      RETADR.
                                        ;*************************************************************************
011150  013746  002400          CKTBIT: MOV     REGNUM,-(SP)    ;SAVE LU REG NO.
011154  010146                          MOV     R1,-(SP)        ;SAVE R1
011156  016637  000004  002352          MOV     4(SP),SUBRPC
011164  162737  000004  002352          SUB     #4,SUBRPC       ;GET PC OF SUBROUTINE CALL
011172  012701  000001                  MOV     #BIT0,R1        ;INIT BIT POINTER
011176  012737  000017  002400          MOV     #17,REGNUM      ;SET REG NO. = 17
011204  004737  005226          4$:     JSR     PC,STPLU        ;CLOCK LINE UNIT 1 CYCLE
011210  000001                          1
011212  004737  003644                  JSR     PC,READLU       ;READ REG 17
011216  030176  000004                  BIT     R1,@4(SP)       ;SEE IF EXPECTED BIT = 1
011222  001013                          BNE     9$              ;BR IF YES
011224  132737  000040  002364          BITB    #TXDATA,REDBYT  ;SEE IF ACTUAL BIT = 0
011232  001422                          BEQ     12$             ;BR IF YES
011234  004737  004500                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT

                                ;REPORT TXDATA NOT CLEARED
011240                                  ERRDF   32,EM32,ERR4
 (4)    011240  104455                                                  TRAP    C$ERDF
```

```
   (5)  011242  000040                                                                    .WORD   32
   (5)  011244  013222                                                                    .WORD   EM32
   (5)  011246  015576                                                                    .WORD   ERR4
  7474  011250  000420                        BR      20$             ;TAKE ERROR RETURN
  7475  011252  132737  000040  002364  9$:   BITB    #TXDATA,REDBYT  ;SEE IF ACTUAL BIT = 1
  7476  011260  001007                        BNE     12$             ;BR IF YES
  7477  011262  004737  004500                JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
  7478                                ;REPORT TXDATA BIT NOT SET
  7479  011266                        ERRDF   33,EM33,ERR4
   (4)  011266  104455                                                                    TRAP    C$ERDF
   (5)  011270  000041                                                                    .WORD   33
   (5)  011272  013251                                                                    .WORD   EM33
   (5)  011274  015576                                                                    .WORD   ERR4
  7480  011276  000405                        BR      20$             ;TAKE ERROR EXIT
  7481  011300  006301                12$:    ASL     R1              ;SHIFT BIT POINTER
  7482  011302  020127  000400                CMP     R1,#400         ;SEE IF 8 BITS SCANNED YET
  7483  011306  001336                        BNE     4$              ;BR IF NO
  7484  011310  000405                        BR      22$
  7485  011312  013706  002346        20$:    MOV     PSTACK,SP       ;RESTORE PROGRAM STACK POINTER TO BASE LEVEL
  7486  011316  013746  002362                MOV     RETADR,-(SP)    ;FIX UP RETURN PC
  7487  011322  000406                        BR      40$
  7488  011324  062766  000002  000004  22$:  ADD     #2,4(SP)        ;FIX UP ERROR-FREE RETURN PC
  7489  011332  012601                        MOV     (SP)+,R1        ;RESTORE R1
  7490  011334  012637  002400                MOV     (SP)+,REGNUM    ;RESTORE REG NO.
  7491  011340  005037  002352        40$:    CLR     SUBRPC          ;CLEAR SUBR CALL PC
  7492  011344  000207                        RTS     PC              ;RETURN
  7493
  7494
  7495
  7496
  7497
  7498                          ;*****************************************************************************
  7499                          ;* LDMSG1 - THIS SUBROUTINE LOADS THE TRANSMITTER SILO WITH MSG1, AND LOADS
  7500                          ;*      THE DATA CHARS INTO THE RCV MSG BUFFER (RCVBUF:), AS EXPECTED DATA
  7501                          ;*      FOR LATER COMPARISON.
  7502                          ;*****************************************************************************
  7503  011346  010146        LDMSG1: MOV     R1,-(SP)        ;SAVE R1
  7504  011350  010246                MOV     R2,-(SP)        ;SAVE R2
  7505  011352  004737  010770        JSR     PC,LODMSG       ;LOAD MSG1 INTO TX SILO
  7506  011356  003220                MSG1
  7507  011360  000011                9.
  7508  011362  012701  003224        MOV     #MSG1+4,R1      ;GET POINTER TO MSG1
  7509  011366  012702  003262        MOV     #RCVBUF,R2      ;GET POINTER TO MSG BUF
  7510  011372  012122          3$:   MOV     (R1)+,(R2)+     ;LOAD A CHAR INTO MSG BUF
  7511  011374  020127  003236        CMP     R1,#MSG1+14.    ;SEE IF DID LAST DATA CHAR YET
  7512  011400  103774                BLO     3$              ;BR IF NOT
  7513  011402  052762  100400  177776  BIS   #CRCCHK!RXBCC,-2(R2) ;SET EXPECTED BCC
  7514  011410  012726  000160        MOV     #160,(SP)+      ;LOAD HI CRC BYTE
  7515  011414  012726  000034        MOV     #034,(SP)+      ;LOAD LO CRC BYTE
  7516  011420  012602                MOV     (SP)+,R2        ;RESTORE R2
  7517  011422  012601                MOV     (SP)+,R1        ;RESTORE R1
  7518  011424  000207                RTS     PC              ;RETURN
  7519
  7520
  7521
  7522
```

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                                                                L 7
7523
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                                .SBTTL  GLOBAL ERROR REPORT SECTION

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

011426  052045  047445  022466  FMT1:   .ASCIZ  /%T%06%N/
011434  000116
011436  047045  040445  040506  FMT2:   .ASCIZ  /%N%AFAILING REG: /
011444  046111  047111  020107
011452  042522  035107  000040
011460  040445  054105  042520  FMT3:   .ASCIZ  /%AEXPECTED: %03%S5%AACTUAL: %03%N/
011466  052103  042105  020072
011474  047445  022463  032523
011502  040445  041501  052524
011510  046101  020072  047445
011516  022463  000116
011522  047045  052045  047045  FMT4:   .ASCIZ  /%N%T%N%T%N/
011530  052045  047045     000
011535     045  031517  051445  FMT5:   .ASCIZ  /%03%S5%03%S5%03%S5%03%N/
011542  022465  031517  051445
011550  022465  031517  051445
011556  022465  031517  047045
011564     000
011565     045  032123  047445  FMT6:   .ASCIZ  /%S4%03%S5%03%S5%03%S5%03%N/
011572  022463  032523  047445
011600  022463  032523  047445
011606  022463  032523  047445
011614  022463  000116
011620  052045  047445  022462  FMT7:   .ASCIZ  /%T%02%N/
011626  000116
011630  040445  054105  042524  FMT8:   .ASCIZ  /%AEXTENDED REG AX%01%A-%T%N/
011636  042116  042105  051040
011644  043505  040440  022530
011652  030517  040445  022455
011660  022524  000116
011664  052045  047045     000  FMT9:   .ASCIZ  /%T%N/
011671     045  050101  020103  FMT10:  .ASCIZ  /%APC OF SUBR CALL: %06%N/
011676  043117  051440  041125
011704  020122  040503  046114
011712  020072  047445  022466
011720  000116
011722  040445  042522  020107  FMT11:  .ASCIZ  /%AREG %02%A LOADED WITH: %03%N/
011730  047445  022462  020101
011736  047514  042101  042105
011744  053440  052111  035110
011752  022440  031517  047045
011760     000
011761     045  022516  052101  FMT19:  .ASCIZ  /%N%ATEST %D2%A NOT RUN%N/
011766  051505  020124  042045
011774  022462  020101  047516
012002  020124  052522  022516
012010  000116
012012  047045  040445  046120  FMT24:  .ASCIZ  /%N%APLEASE INSURE RUN SWITCH ON MICROPROCESSOR IS ON%N/
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                012020  040505  042523  044440
                012026  051516  051125  020105
                012034  052522  020116  053523
                012042  052111  044103  047440
                012050  020116  044515  051103
                012056  050117  047522  042503
                012064  051523  051117  044440
                012072  020123  047117  047045
                012100     000
 7546
 7547
 7548
 7549   012101     103  051123  040440  EM1:    .ASCIZ  /CSR ADDRESS TIME-OUT (SEL0)/
                012106  042104  042522  051523
                012114  052040  046511  026505
                012122  052517  020124  051450
                012130  046105  024460     000
 7550   012135     122  043505  047040  EM2:    .ASCIZ  /REG NOT INITIALIZED BY MST CLR/
                012142  052117  044440  044516
                012150  044524  046101  055111
                012156  042105  041040  020131
                012164  051515  020124  046103
                012172  000122
 7551   012174  042522  020107  044515  EM3:    .ASCIZ  /REG MISCOMPARE/
                012202  041523  046517  040520
                012210  042522     000
 7552   012213     122  043505  047040  EM4:    .ASCIZ  /REG NOT INITIALIZED BY UNIBUS RESET (INIT)/
                012220  052117  044440  044516
                012226  044524  046101  055111
                012234  042105  041040  020131
                012242  047125  041111  051525
                012250  051040  051505  052105
                012256  024040  047111  052111
                012264  000051
 7553   012266  040515  047111  020124  EM5:    .ASCIZ  /MAINT CLK BIT STUCK AT 0/
                012274  046103  020113  044502
                012302  020124  052123  041525
                012310  020113  052101  030040
                012316     000
 7554   012317     115  044501  052116  EM6:    .ASCIZ  /MAINT CLK BIT STUCK AT 1/
                012324  041440  045514  041040
                012332  052111  051440  052524
                012340  045503  040440  020124
                012346  000061
 7555   012350  051117  054504  047040  EM7:    .ASCIZ  /ORDY NOT SET/
                012356  052117  051440  052105
                012364     000
 7556   012365     117  042122  020131  EM8:    .ASCIZ  /ORDY NOT CLEARED/
                012372  047516  020124  046103
                012400  040505  042522  000104
 7557   012406  041517  051117  047040  EM9:    .ASCIZ  /OCOR NOT SET/
                012414  052117  051440  052105
                012422     000
 7558   012423     117  047503  020122  EM10:   .ASCIZ  /OCOR NOT CLEARED/
                012430  047516  020124  046103
                012436  040505  042522  000104
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 7559  012444  040517  052103  047040  EM11:   .ASCIZ  /OACT NOT SET/
       012452  052117  051440  052105
       012460     000
 7560  012461     117  041501  020124  EM12:   .ASCIZ  /OACT NOT CLEARED/
       012466  047516  020124  046103
       012474  040505  042522  000104
 7561  012502  047125  051122  047040  EM13:   .ASCIZ  /UNRR NOT CLEARED BY SOM/
       012510  052117  041440  042514
       012516  051101  042105  041040
       012524  020131  047523  000115
 7562  012532  047125  051122  047040  EM14:   .ASCIZ  /UNRR NOT SET/
       012540  052117  051440  052105
       012546     000
 7563  012547     125  051116  020122  EM15:   .ASCIZ  /UNRR NOT CLEARED BY OC/
       012554  047516  020124  046103
       012562  040505  042522  020104
       012570  054502  047440  000103
 7564  012576  047125  051122  047040  EM16:   .ASCIZ  /UNRR NOT CLEARED/
       012604  052117  041440  042514
       012612  051101  042105     000
 7565  012617     111  042122  020131  EM17:   .ASCIZ  /IRDY NOT SET/
       012624  047516  020124  042523
       012632  000124
 7566  012634  051111  054504  047040  EM18:   .ASCIZ  /IRDY NOT CLEARED/
       012642  052117  041440  042514
       012650  051101  042105     000
 7567  012655     111  044503  020122  EM19:   .ASCIZ  /ICIR NOT SET/
       012662  047516  020124  042523
       012670  000124
 7568  012672  041511  051111  047040  EM20:   .ASCIZ  /ICIR NOT CLEARED/
       012700  052117  041440  042514
       012706  051101  042105     000
 7569  012713     111  041501  020124  EM21:   .ASCIZ  /IACT NOT SET/
       012720  047516  020124  042523
       012726  000124
 7570  012730  040511  052103  047040  EM22:   .ASCIZ  /IACT NOT CLEARED/
       012736  052117  041440  042514
       012744  051101  042105     000
 7571  012751     104  051523  020111  EM23:   .ASCIZ  /DSSI NOT CLEARED/
       012756  047516  020124  046103
       012764  040505  042522  000104
 7572  012772  051504  044523  047040  EM24:   .ASCIZ  /DSSI NOT SET/
       013000  052117  051440  052105
       013006     000
 7573  013007     104  051523  020111  EM25:   .ASCIZ  /DSSI NOT CLEARED BY MST CLR/
       013014  047516  020124  046103
       013022  040505  042522  020104
       013030  054502  046440  052123
       013036  041440  051114     000
 7574  013043     111  041516  051117  EM26:   .ASCIZ  /INCORRECT DATA CHAR RCV'D/
       013050  042522  052103  042040
       013056  052101  020101  044103
       013064  051101  051040  053103
       013072  042047     000
 7575  013075     111  041516  051117  EM27:   .ASCIZ  /INCORRECT CRC BYTE RCV'D/
       013102  042522  052103  041440
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                013110  041522  041040  052131
                013116  020105  041522  023526
                013124  000104
 7576           013126  051522  046517  047040  EM28:   .ASCIZ  /RSOM NOT CLEARED/
                013134  052117  041440  042514
                013142  051101  042105     000
 7577           013147     122  047523  020115  EM29:   .ASCIZ  /RSOM NOT SET/
                013154  047516  020124  042523
                013162  000124
 7578           013164  042522  046517  047040  EM30:   .ASCIZ  /REOM NOT CLEARED/
                013172  052117  041440  042514
                013200  051101  042105     000
 7579           013205     122  047505  020115  EM31:   .ASCIZ  /REOM NOT SET/
                013212  047516  020124  042523
                013220  000124
 7580           013222  054124  040504  040524  EM32:   .ASCIZ  /TXDATA BIT NOT CLEARED/
                013230  041040  052111  047040
                013236  052117  041440  042514
                013244  051101  042105     000
 7581           013251     124  042130  052101  EM33:   .ASCIZ  /TXDATA BIT NOT SET/
                013256  020101  044502  020124
                013264  047516  020124  042523
                013272  000124
 7582           013274  041522  023526  020104  EM34:   .ASCIZ  /RCV'D DATA MISCOMPARE/
                013302  040504  040524  046440
                013310  051511  047503  050115
                013316  051101  000105
 7583           013322  041502  020103  047516  EM35:   .ASCIZ  /BCC NOT CLEARED/
                013330  020124  046103  040505
                013336  042522  000104
 7584           013342  041502  020103  047516  EM36:   .ASCIZ  /BCC NOT SET/
                013350  020124  042523  000124
 7585           013356  041105  045514  047040  EM37:   .ASCIZ  /EBLK NOT CLEARED/
                013364  052117  041440  042514
                013372  051101  042105     000
 7586           013377     105  046102  020113  EM38:   .ASCIZ  /EBLK NOT SET/
                013404  047516  020124  042523
                013412  000124
 7587           013414  040522  020102  047516  EM39:   .ASCIZ  /RAB NOT CLEARED/
                013422  020124  046103  040505
                013430  042522  000104
 7588           013434  040522  020102  047516  EM40:   .ASCIZ  /RAB NOT SET/
                013442  020124  042523  000124
 7589           013450  053117  051122  047040  EM41:   .ASCIZ  /OVRR NOT CLEARED/
                013456  052117  041440  042514
                013464  051101  042105     000
 7590           013471     117  051126  020122  EM42:   .ASCIZ  /OVRR NOT SET/
                013476  047516  020124  042523
                013504  000124
 7591           013506  053523  050040  041501  EM43:   .ASCIZ  /SW PACK #1 INCORRECT/
                013514  020113  030443  044440
                013522  041516  051117  042522
                013530  052103     000
 7592           013533     123  020127  040520  EM44:   .ASCIZ  /SW PACK #2 INCORRECT/
                013540  045503  021440  020062
                013546  047111  047503  051122
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```
                013554  041505  000124
7593            013560  053523  050040  041501  EM45:   .ASCIZ  /SW PACK #3 INCORRECT/
                013566  020113  031443  044440
                013574  041516  051117  042522
                013602  052103     000
7594            013605     122  053103  051440  EM46:   .ASCIZ  /RCV SILO NOT CLEARED BY IC/
                013612  046111  020117  047516
                013620  020124  046103  040505
                013626  042522  020104  054502
                013634  044440  000103
7595            013640  051501  042523  041115  EM47:   .ASCIZ  /ASSEMB BIT COUNT INCORRECT/
                013646  041040  052111  041440
                013654  052517  052116  044440
                013662  041516  051117  042522
                013670  052103     000
7596            013673     117  042104  053040  EM48:   .ASCIZ  /ODD VRC PARITY BIT NOT SET/
                013700  041522  050040  051101
                013706  052111  020131  044502
                013714  020124  047516  020124
                013722  042523  000124
7597            013726  042117  020104  051126  EM49:   .ASCIZ  /ODD VRC PARITY BIT NOT CLEARED/
                013734  020103  040520  044522
                013742  054524  041040  052111
                013750  047040  052117  041440
                013756  042514  051101  042105
                013764     000
7598            013765     105  042526  020116  EM50:   .ASCIZ  /EVEN VRC PARITY BIT NOT SET/
                013772  051126  020103  040520
                014000  044522  054524  041040
                014006  052111  047040  052117
                014014  051440  052105     000
7599            014021     105  042526  020116  EM51:   .ASCIZ  /EVEN VRC PARITY BIT NOT CLEARED/
                014026  051126  020103  040520
                014034  044522  054524  041040
                014042  052111  047040  052117
                014050  041440  042514  051101
                014056  042105     00C
7600            014061     122  040505  054504  EM52:   .ASCIZ  /READY NOT SET AFTER AX REG WRITE/
                014066  047040  052117  051440
                014074  052105  040440  052106
                014102  051105  040440  020130
                014110  042522  020107  051127
                014116  052111  000105
7601            014122  042522  042101  020131  EM53:   .ASCIZ  /READY NOT SET AFTER AX REG READ/
                014130  047516  020124  042523
                014136  020124  043101  042524
                014144  020122  054101  051040
                014152  043505  051040  040505
                014160  000104
7602            014162  054124  052440  042116  EM54:   .ASCIZ  /TX UNDERRUN ERROR/
                014170  051105  052522  020116
                014176  051105  047522  000122
7603            014204  052122  020123  047516  EM60:   .ASCIZ  /RTS NOT SET/
                014212  020124  042523  000124
7604            014220  052122  020123  047516  EM65:   .ASCIZ  /RTS NOT CLEARED/
                014226  020124  046103  040505
```

```
                014234  042522  000104
 7605
 7606
 7607
 7608   014240  047111  052502  027523  DH1:    .ASCIZ  &INBUS/OUTBUS REG &
        014246  052517  041124  051525
        014254  051040  043505  000040
 7609   014262  044514  042516  052440  DH2:    .ASCIZ  /LINE UNIT INBUS REGS :/
        014270  044516  020124  047111
        014276  052502  020123  042522
        014304  051507  035040     000
 7610   014311     122  043505  030061  DH3:    .ASCIZ  /REG10   REG11   REG12   REG13/
        014316  020040  051040  043505
        014324  030461  020040  051040
        014332  043505  031061  020040
        014340  051040  043505  031461
        014346     000
 7611   014347     040  020040  051040  DH4:    .ASCIZ  /    REG14   REG15   REG16   REG17/
        014354  043505  032061  020040
        014362  051040  043505  032461
        014370  020040  051040  043505
        014376  033061  020040  051040
        014404  043505  033461     000
 7612   014411     061  000065          DH5:    .ASCIZ  /15/
 7613   014414  033061     000          DH6:    .ASCIZ  /16/
 7614   014417     114  047111  020105  DH7:    .ASCIZ  /LINE UNIT EXTENDED REGS :/
        014424  047125  052111  042440
        014432  052130  047105  042504
        014440  020104  042522  051507
        014446  035040     000
 7615   014451     101  030130  030455  DH8:    .ASCIZ  /AX0-15  AX0-16  AX1-15  AX1-16/
        014456  020065  040440  030130
        014464  030455  020066  040440
        014472  030530  030455  020065
        014500  040440  030530  030455
        014506  000066
 7616   014510  020040  020040  054101  DH9:    .ASCIZ  /    AX2-15  AX2-16  AX3-15  AX3-16/
        014516  026462  032461  020040
        014524  054101  026462  033061
        014532  020040  054101  026463
        014540  032461  020040  054101
        014546  026463  033061     000
 7617
 7618           014554                  .EVEN
 7619
 7620
 7621
 7622
 7623
 7624   014554                          BGNMSG  ERR1
  (3)   014554                                                          ERR1::
 7625   014554                          PRINTB  #FMT1,#ADDRES,MPCSR
  (9)   014554  013746  002446                                                  MOV     MPCSR,-(SP)
  (8)   014560  012746  035560                                                  MOV     #ADDRES,-(SP)
  (7)   014564  012746  011426                                                  MOV     #FMT1,-(SP)
  (6)   014570  012746  000003                                                  MOV     #3,-(SP)
```

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  (3)  014574  010600                                                    MOV     SP,R0
  (4)  014576  104414                                                    TRAP    C$PNTB
  (4)  014600  062706  000010                                            ADD     #10,SP
7626   014604                        ENDMSG
  (3)  014604                                                    L10002:
  (3)  014604  104423                                                    TRAP    C$MSG
7627
7628
7629
7630   014606                        BGNMSG  ERR2
  (3)  014606                                                    ERR2::
7631   014606                        PRINTB  #FMT1,#ADDRES,MPCSR
  (9)  014606  013746  002446                                            MOV     MPCSR,-(SP)
  (8)  014612  012746  035560                                            MOV     #ADDRES,-(SP)
  (7)  014616  012746  011426                                            MOV     #FMT1,-(SP)
  (6)  014622  012746  000003                                            MOV     #3,-(SP)
  (3)  014626  010600                                                    MOV     SP,R0
  (4)  014630  104414                                                    TRAP    C$PNTB
  (4)  014632  062706  000010                                            ADD     #10,SP
7632   014636                        PRINTB  #FMT2
  (7)  014636  012746  011436                                            MOV     #FMT2,-(SP)
  (6)  014642  012746  000001                                            MOV     #1,-(SP)
  (3)  014646  010600                                                    MOV     SP,R0
  (4)  014650  104414                                                    TRAP    C$PNTB
  (4)  014652  062706  000004                                            ADD     #4,SP
7633   014656                        PRINTB  #FMT7,#DH1,REGNUM
  (9)  014656  013746  002400                                            MOV     REGNUM,-(SP)
  (8)  014662  012746  014240                                            MOV     #DH1,-(SP)
  (7)  014666  012746  011620                                            MOV     #FMT7,-(SP)
  (6)  014672  012746  000003                                            MOV     #3,-(SP)
  (3)  014676  010600                                                    MOV     SP,R0
  (4)  014700  104414                                                    TRAP    C$PNTB
  (4)  014702  062706  000010                                            ADD     #10,SP
7634   014706                        PRINTB  #FMT3,GOODAT,BADDAT
  (9)  014706  013746  002406                                            MOV     BADDAT,-(SP)
  (8)  014712  013746  002404                                            MOV     GOODAT,-(SP)
  (7)  014716  012746  011460                                            MOV     #FMT3,-(SP)
  (6)  014722  012746  000003                                            MOV     #3,-(SP)
  (3)  014726  010600                                                    MOV     SP,R0
  (4)  014730  104414                                                    TRAP    C$PNTB
  (4)  014732  062706  000010                                            ADD     #10,SP
7635   014736                        PRINTX  #FMT4,#DH2,#DH3
  (9)  014736  012746  014311                                            MOV     #DH3,-(SP)
  (8)  014742  012746  014262                                            MOV     #DH2,-(SP)
  (7)  014746  012746  011522                                            MOV     #FMT4,-(SP)
  (6)  014752  012746  000003                                            MOV     #3,-(SP)
  (3)  014756  010600                                                    MOV     SP,R0
  (4)  014760  104415                                                    TRAP    C$PNTX
  (4)  014762  062706  000010                                            ADD     #10,SP
7636   014766                        PRINTX  #FMT5,LUR10,LUR11,LUR12,LUR13
  (11) 014766  013746  002310                                            MOV     LUR13,-(SP)
  (10) 014772  013746  002306                                            MOV     LUR12,-(SP)
  (9)  014776  013746  002304                                            MOV     LUR11,-(SP)
  (8)  015002  013746  002302                                            MOV     LUR10,-(SP)
  (7)  015006  012746  011535                                            MOV     #FMT5,-(SP)
  (6)  015012  012746  000005                                            MOV     #5,-(SP)
```

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  (3)  015016  010600                                                    MOV     SP,R0
  (4)  015020  104415                                                    TRAP    C$PNTX
  (4)  015022  062706  000014                                            ADD     #14,SP
7637   015026                        PRINTX  #FMT9,#DH4
  (8)  015026  012746  014347                                            MOV     #DH4,-(SP)
  (7)  015032  012746  011664                                            MOV     #FMT9,-(SP)
  (6)  015036  012746  000002                                            MOV     #2,-(SP)
  (3)  015042  010600                                                    MOV     SP,R0
  (4)  015044  104415                                                    TRAP    C$PNTX
  (4)  015046  062706  000006                                            ADD     #6,SP
7638   015052                        PRINTX  #FMT6,LUR14,LUR15,LUR16,LUR17
  (11) 015052  013746  002320                                            MOV     LUR17,-(SP)
  (10) 015056  013746  002316                                            MOV     LUR16,-(SP)
  (9)  015062  013746  002314                                            MOV     LUR15,-(SP)
  (8)  015066  013746  002312                                            MOV     LUR14,-(SP)
  (7)  015072  012746  011565                                            MOV     #FMT6,-(SP)
  (6)  015076  012746  000005                                            MOV     #5,-(SP)
  (3)  015102  010600                                                    MOV     SP,R0
  (4)  015104  104415                                                    TRAP    C$PNTX
  (4)  015106  062706  000014                                            ADD     #14,SP
7639   015112                        ENDMSG
  (3)  015112                                                  L10003:
  (3)  015112  104423                                                    TRAP    C$MSG
7640
7641
7642
7643
7644
7645   015114                        BGNMSG  ERR3
  (3)  015114                                                  ERR3::
7646   015114                        PRINTB  #FMT1,#ADDRES,MPCSR
  (9)  015114  013746  002446                                                  MOV     MPCSR,-(SP)
  (8)  015120  012746  035560                                                  MOV     #ADDRES,-(SP)
  (7)  015124  012746  011426                                                  MOV     #FMT1,-(SP)
  (6)  015130  012746  000003                                                  MOV     #3,-(SP)
  (3)  015134  010600                                                          MOV     SP,R0
  (4)  015136  104414                                                          TRAP    C$PNTB
  (4)  015140  062706  000010                                                  ADD     #10,SP
7647   015144                        PRINTB  #FMT2
  (7)  015144  012746  011436                                                  MOV     #FMT2,-(SP)
  (6)  015150  012746  000001                                                  MOV     #1,-(SP)
  (3)  015154  010600                                                          MOV     SP,R0
  (4)  015156  104414                                                          TRAP    C$PNTB
  (4)  015160  062706  000004                                                  ADD     #4,SP
7648   015164                        PRINTB  #FMT8,TMP1,TMP0
  (9)  015164  013746  002530                                                  MOV     TMP0,-(SP)
  (8)  015170  013746  002532                                                  MOV     TMP1,-(SP)
  (7)  015174  012746  011630                                                  MOV     #FMT8,-(SP)
  (6)  015200  012746  000003                                                  MOV     #3,-(SP)
  (3)  015204  010600                                                          MOV     SP,R0
  (4)  015206  104414                                                          TRAP    C$PNTB
  (4)  015210  062706  00001C                                                  ADD     #10,SP
7649   015214                        PRINTB  #FMT3,GOODAT,BADDAT
  (9)  015214  013746  002406                                                  MOV     BADDAT,-(SP)
  (8)  015220  013746  002404                                                  MOV     GOODAT,-(SP)
  (7)  015224  012746  011460                                                  MOV     #FMT3,-(SP)
```

```
  (6)  015230  012746  000003                                          MOV     #3,-(SP)
  (3)  015234  010600                                                  MOV     SP,R0
  (4)  015236  104414                                                  TRAP    C$PNTB
  (4)  015240  062706  000010                                          ADD     #10,SP
7650   015244                      PRINTX  #FMT4,#DH2,#DH3
  (9)  015244  012746  014311                                          MOV     #DH3,-(SP)
  (8)  015250  012746  014262                                          MOV     #DH2,-(SP)
  (7)  015254  012746  011522                                          MOV     #FMT4,-(SP)
  (6)  015260  012746  000003                                          MOV     #3,-(SP)
  (3)  015264  010600                                                  MOV     SP,R0
  (4)  015266  104415                                                  TRAP    C$PNTX
  (4)  015270  062706  000010                                          ADD     #10,SP
7651   015274                      PRINTX  #FMT5,LUR10,LUR11,LUR12,LUR13
 (11)  015274  013746  002310                                          MOV     LUR13,-(SP)
 (10)  015300  013746  002306                                          MOV     LUR12,-(SP)
  (9)  015304  013746  002304                                          MOV     LUR11,-(SP)
  (8)  015310  013746  002302                                          MOV     LUR10,-(SP)
  (7)  015314  012746  011535                                          MOV     #FMT5,-(SP)
  (6)  015320  012746  000005                                          MOV     #5,-(SP)
  (3)  015324  010600                                                  MOV     SP,R0
  (4)  015326  104415                                                  TRAP    C$PNTX
  (4)  015330  062706  000014                                          ADD     #14,SP
7652   015334                      PRINTX  #FMT9,#DH4
  (8)  015334  012746  014347                                          MOV     #DH4,-(SP)
  (7)  015340  012746  011664                                          MOV     #FMT9,-(SP)
  (6)  015344  012746  000002                                          MOV     #2,-(SP)
  (3)  015350  010600                                                  MOV     SP,R0
  (4)  015352  104415                                                  TRAP    C$PNTX
  (4)  015354  062706  000006                                          ADD     #6,SP
7653   015360                      PRINTX  #FMT6,LUR14,LUR15,LUR16,LUR17
 (11)  015360  013746  002320                                          MOV     LUR17,-(SP)
 (10)  015364  013746  002316                                          MOV     LUR16,-(SP)
  (9)  015370  013746  002314                                          MOV     LUR15,-(SP)
  (8)  015374  013746  002312                                          MOV     LUR14,-(SP)
  (7)  015400  012746  011565                                          MOV     #FMT6,-(SP)
  (6)  015404  012746  000005                                          MOV     #5,-(SP)
  (3)  015410  010600                                                  MOV     SP,R0
  (4)  015412  104415                                                  TRAP    C$PNTX
  (4)  015414  062706  000014                                          ADD     #14,SP
7654   015420                      PRINTX  #FMT4,#DH7,#DH8
  (9)  015420  012746  014451                                          MOV     #DH8,-(SP)
  (8)  015424  012746  014417                                          MOV     #DH7,-(SP)
  (7)  015430  012746  011522                                          MOV     #FMT4,-(SP)
  (6)  015434  012746  000003                                          MOV     #3,-(SP)
  (3)  015440  010600                                                  MOV     SP,R0
  (4)  015442  104415                                                  TRAP    C$PNTX
  (4)  015444  062706  000010                                          ADD     #10,SP
7655   015450                      PRINTX  #FMT5,AX0.15,AX0.16,AX1.15,AX1.16
 (11)  015450  013746  002330                                          MOV     AX1.16,-(SP)
 (10)  015454  013746  002326                                          MOV     AX1.15,-(SP)
  (9)  015460  013746  002324                                          MOV     AX0.16,-(SP)
  (8)  015464  013746  002322                                          MOV     AX0.15,-(SP)
  (7)  015470  012746  011535                                          MOV     #FMT5,-(SP)
  (6)  015474  012746  000005                                          MOV     #5,-(SP)
  (3)  015500  010600                                                  MOV     SP,R0
  (4)  015502  104415                                                  TRAP    C$PNTX
```

```
  (4)  015504  062706  000014                                                    ADD     #14,SP
7656   015510
                                PRINTX  #FMT9,#DH9
  (8)  015510  012746  014510                                                    MOV     #DH9,-(SP)
  (7)  015514  012746  011664                                                    MOV     #FMT9,-(SP)
  (6)  015520  012746  000002                                                    MOV     #2,-(SP)
  (3)  015524  010600                                                            MOV     SP,R0
  (4)  015526  104415                                                            TRAP    C$PNTX
  (4)  015530  062706  000006                                                    ADD     #6,SP
7657   015534
                                PRINTX  #FMT6,AX2.15,AX2.16,AX3.15,AX3.16
 (11)  015534  013746  002340                                                    MOV     AX3.16,-(SP)
 (10)  015540  013746  002336                                                    MOV     AX3.15,-(SP)
  (9)  015544  013746  002334                                                    MOV     AX2.16,-(SP)
  (8)  015550  013746  002332                                                    MOV     AX2.15,-(SP)
  (7)  015554  012746  011565                                                    MOV     #FMT6,-(SP)
  (6)  015560  012746  000005                                                    MOV     #5,-(SP)
  (3)  015564  010600                                                            MOV     SP,R0
  (4)  015566  104415                                                            TRAP    C$PNTX
  (4)  015570  062706  000014                                                    ADD     #14,SP
7658   015574
                                ENDMSG
  (3)  015574                                                           L10004:
  (3)  015574  104423                                                            TRAP    C$MSG
7659
7660
7661
7662
7663
7664   015576
                                BGNMSG  ERR4
  (3)  015576                                                           ERR4::
7665   015576
                                PRINTB  #FMT10,SUBRPC
  (8)  015576  013746  002352                                                    MOV     SUBRPC,-(SP)
  (7)  015602  012746  011671                                                    MOV     #FMT10,-(SP)
  (6)  015606  012746  000002                                                    MOV     #2,-(SP)
  (3)  015612  010600                                                            MOV     SP,R0
  (4)  015614  104414                                                            TRAP    C$PNTB
  (4)  015616  062706  000006                                                    ADD     #6,SP
7666   015622
                                PRINTB  #FMT1,#ADDRES,MPCSR
  (9)  015622  013746  002446                                                    MOV     MPCSR,-(SP)
  (8)  015626  012746  035560                                                    MOV     #ADDRES,-(SP)
  (7)  015632  012746  011426                                                    MOV     #FMT1,-(SP)
  (6)  015636  012746  000003                                                    MOV     #3,-(SP)
  (3)  015642  010600                                                            MOV     SP,R0
  (4)  015644  104414                                                            TRAP    C$PNTB
  (4)  015646  062706  000010                                                    ADD     #10,SP
7667   015652
                                PRINTB  #FMT2
  (7)  015652  012746  011436                                                    MOV     #FMT2,-(SP)
  (6)  015656  012746  000001                                                    MOV     #1,-(SP)
  (3)  015662  010600                                                            MOV     SP,R0
  (4)  015664  104414                                                            TRAP    C$PNTB
  (4)  015666  062706  000004                                                    ADD     #4,SP
7668   015672
                                PRINTB  #FMT7,#DH1,REGNUM
  (9)  015672  013746  002400                                                    MOV     REGNUM,-(SP)
  (8)  015676  012746  014240                                                    MOV     #DH1,-(SP)
  (7)  015702  012746  011620                                                    MOV     #FMT7,-(SP)
  (6)  015706  012746  000003                                                    MOV     #3,-(SP)
  (3)  015712  010600                                                            MOV     SP,R0
  (4)  015714  104414                                                            TRAP    C$PNTB
```

```
  (4)  015716  062706  000010                          ADD     #10,SP
7669   015722
                        PRINTX  #FMT4,#DH2,#DH3
  (9)  015722  012746  014311                          MOV     #DH3,-(SP)
  (8)  015726  012746  014262                          MOV     #DH2,-(SP)
  (7)  015732  012746  011522                          MOV     #FMT4,-(SP)
  (6)  015736  012746  000003                          MOV     #3,-(SP)
  (3)  015742  010600                                  MOV     SP,R0
  (4)  015744  104415                                  TRAP    C$PNTX
  (4)  015746  062706  000010                          ADD     #10,SP
7670   015752
                        PRINTX  #FMT5,LUR10,LUR11,LUR12,LUR13
 (11)  015752  013746  002310                          MOV     LUR13,-(SP)
 (10)  015756  013746  002306                          MOV     LUR12,-(SP)
  (9)  015762  013746  002304                          MOV     LUR11,-(SP)
  (8)  015766  013746  002302                          MOV     LUR10,-(SP)
  (7)  015772  012746  011535                          MOV     #FMT5,-(SP)
  (6)  015776  012746  000005                          MOV     #5,-(SP)
  (3)  016002  010600                                  MOV     SP,R0
  (4)  016004  104415                                  TRAP    C$PNTX
  (4)  016006  062706  000014                          ADD     #14,SP
7671   016012
                        PRINTX  #FMT9,#DH4
  (8)  016012  012746  014347                          MOV     #DH4,-(SP)
  (7)  016016  012746  011664                          MOV     #FMT9,-(SP)
  (6)  016022  012746  000002                          MOV     #2,-(SP)
  (3)  016026  010600                                  MOV     SP,R0
  (4)  016030  104415                                  TRAP    C$PNTX
  (4)  016032  062706  000006                          ADD     #6,SP
7672   016036
                        PRINTX  #FMT6,LUR14,LUR15,LUR16,LUR17
 (11)  016036  013746  002320                          MOV     LUR17,-(SP)
 (10)  016042  013746  002316                          MOV     LUR16,-(SP)
  (9)  016046  013746  002314                          MOV     LUR15,-(SP)
  (8)  016052  013746  002312                          MOV     LUR14,-(SP)
  (7)  016056  012746  011565                          MOV     #FMT6,-(SP)
  (6)  016062  012746  000005                          MOV     #5,-(SP)
  (3)  016066  010600                                  MOV     SP,R0
  (4)  016070  104415                                  TRAP    C$PNTX
  (4)  016072  062706  000014                          ADD     #14,SP
7673   016076
                        PRINTX  #FMT4,#DH7,#DH8
  (9)  016076  012746  014451                          MOV     #DH8,-(SP)
  (8)  016102  012746  014417                          MOV     #DH7,-(SP)
  (7)  016106  012746  011522                          MOV     #FMT4,-(SP)
  (6)  016112  012746  000003                          MOV     #3,-(SP)
  (3)  016116  010600                                  MOV     SP,R0
  (4)  016120  104415                                  TRAP    C$PNTX
  (4)  016122  062706  000010                          ADD     #10,SP
7674   016126
                        PRINTX  #FMT5,AX0.15,AX0.16,AX1.15,AX1.16
 (11)  016126  013746  002330                          MOV     AX1.16,-(SP)
 (10)  016132  013746  002326                          MOV     AX1.15,-(SP)
  (9)  016136  013746  002324                          MOV     AX0.16,-(SP)
  (8)  016142  013746  002322                          MOV     AX0.15,-(SP)
  (7)  016146  012746  011535                          MOV     #FMT5,-(SP)
  (6)  016152  012746  000005                          MOV     #5,-(SP)
  (3)  016156  010600                                  MOV     SP,R0
  (4)  016160  104415                                  TRAP    C$PNTX
  (4)  016162  062706  000014                          ADD     #14,SP
7675   016166
                        PRINTX  #FMT9,#DH9
  (8)  016166  012746  014510                          MOV     #DH9,-(SP)
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   (7)  016172  012746  011664                                                    MOV     #FMT9,-(SP)
   (6)  016176  012746  000002                                                    MOV     #2,-(SP)
   (3)  016202  010600                                                            MOV     SP,R0
   (4)  016204  104415                                                            TRAP    C$PNTX
   (4)  016206  062706  000006                                                    ADD     #6,SP
 7676   016212                       PRINTX  #FMT6,AX2.15,AX2.16,AX3.15,AX3.16
  (11)  016212  013746  002340                                                    MOV     AX3.16,-(SP)
  (10)  016216  013746  002336                                                    MOV     AX3.15,-(SP)
   (9)  016222  013746  002334                                                    MOV     AX2.16,-(SP)
   (8)  016226  013746  002332                                                    MOV     AX2.15,-(SP)
   (7)  016232  012746  011565                                                    MOV     #FMT6,-(SP)
   (6)  016236  012746  000005                                                    MOV     #5,-(SP)
   (3)  016242  010600                                                            MOV     SP,R0
   (4)  016244  104415                                                            TRAP    C$PNTX
   (4)  016246  062706  000014                                                    ADD     #14,SP
 7677   016252                       ENDMSG
   (3)  016252                                                          L10005:
   (3)  016252  104423                                                            TRAP    C$MSG
 7678
 7679
 7680
 7681
 7682
 7683   016254                       BGNMSG  ERR5
   (3)  016254                                                          ERR5::
 7684   016254                       PRINTB  #FMT1,#ADDRES,MPCSR
   (9)  016254  013746  002446                                                    MOV     MPCSR,-(SP)
   (8)  016260  012746  035560                                                    MOV     #ADDRES,-(SP)
   (7)  016264  012746  011426                                                    MOV     #FMT1,-(SP)
   (6)  016270  012746  000003                                                    MOV     #3,-(SP)
   (3)  016274  010600                                                            MOV     SP,R0
   (4)  016276  104414                                                            TRAP    C$PNTB
   (4)  016300  062706  000010                                                    ADD     #10,SP
 7685   016304                       PRINTB  #FMT11,REGNUM,LOADAT
   (9)  016304  013746  002410                                                    MOV     LOADAT,-(SP)
   (8)  016310  013746  002400                                                    MOV     REGNUM,-(SP)
   (7)  016314  012746  011722                                                    MOV     #FMT11,-(SP)
   (6)  016320  012746  000003                                                    MOV     #3,-(SP)
   (3)  016324  010600                                                            MOV     SP,R0
   (4)  016326  104414                                                            TRAP    C$PNTB
   (4)  016330  062706  000010                                                    ADD     #10,SP
 7686   016334                       PRINTB  #FMT2
   (7)  016334  012746  011436                                                    MOV     #FMT2,-(SP)
   (6)  016340  012746  000001                                                    MOV     #1,-(SP)
   (3)  016344  010600                                                            MOV     SP,R0
   (4)  016346  104414                                                            TRAP    C$PNTB
   (4)  016350  062706  000004                                                    ADD     #4,SP
 7687   016354                       PRINTB  #FMT8,TMP1,TMP0
   (9)  016354  013746  002530                                                    MOV     TMP0,-(SP)
   (8)  016360  013746  002532                                                    MOV     TMP1,-(SP)
   (7)  016364  012746  011630                                                    MOV     #FMT8,-(SP)
   (6)  016370  012746  000003                                                    MOV     #3,-(SP)
   (3)  016374  010600                                                            MOV     SP,R0
   (4)  016376  104414                                                            TRAP    C$PNTB
   (4)  016400  062706  000010                                                    ADD     #10,SP
 7688   016404                       PRINTB  #FMT3,GOODAT,BADDAT
```

```
   (9)  016404  013746  002406                                    MOV     BADDAT,-(SP)
   (8)  016410  013746  002404                                    MOV     GOODAT,-(SP)
   (7)  016414  012746  011460                                    MOV     #FMT3,-(SP)
   (6)  016420  012746  000003                                    MOV     #3,-(SP)
   (3)  016424  010600                                            MOV     SP,R0
   (4)  016426  104414                                            TRAP    C$PNTB
   (4)  016430  062706  000010                                    ADD     #10,SP
7689    016434                      PRINTX  #FMT4,#DH2,#DH3
   (9)  016434  012746  014311                                    MOV     #DH3,-(SP)
   (8)  016440  012746  014262                                    MOV     #DH2,-(SP)
   (7)  016444  012746  011522                                    MOV     #FMT4,-(SP)
   (6)  016450  012746  000003                                    MOV     #3,-(SP)
   (3)  016454  010600                                            MOV     SP,R0
   (4)  016456  104415                                            TRAP    C$PNTX
   (4)  016460  062706  000010                                    ADD     #10,SP
7690    016464                      PRINTX  #FMT5,LUR10,LUR11,LUR12,LUR13
  (11)  016464  013746  002310                                    MOV     LUR13,-(SP)
  (10)  016470  013746  002306                                    MOV     LUR12,-(SP)
   (9)  016474  013746  002304                                    MOV     LUR11,-(SP)
   (8)  016500  013746  002302                                    MOV     LUR10,-(SP)
   (7)  016504  012746  011535                                    MOV     #FMT5,-(SP)
   (6)  016510  012746  000005                                    MOV     #5,-(SP)
   (3)  016514  010600                                            MOV     SP,R0
   (4)  016516  104415                                            TRAP    C$PNTX
   (4)  016520  062706  000014                                    ADD     #14,SP
7691    016524                      PRINTX  #FMT9,#DH4
   (8)  016524  012746  014347                                    MOV     #DH4,-(SP)
   (7)  016530  012746  011664                                    MOV     #FMT9,-(SP)
   (6)  016534  012746  000002                                    MOV     #2,-(SP)
   (3)  016540  010600                                            MOV     SP,R0
   (4)  016542  104415                                            TRAP    C$PNTX
   (4)  016544  062706  000006                                    ADD     #6,SP
7692    016550                      PRINTX  #FMT6,LUR14,LUR15,LUR16,LUR17
  (11)  016550  013746  002320                                    MOV     LUR17,-(SP)
  (10)  016554  013746  002316                                    MOV     LUR16,-(SP)
   (9)  016560  013746  002314                                    MOV     LUR15,-(SP)
   (8)  016564  013746  002312                                    MOV     LUR14,-(SP)
   (7)  016570  012746  011565                                    MOV     #FMT6,-(SP)
   (6)  016574  012746  000005                                    MOV     #5,-(SP)
   (3)  016600  010600                                            MOV     SP,R0
   (4)  016602  104415                                            TRAP    C$PNTX
   (4)  016604  062706  000014                                    ADD     #14,SP
7693    016610                      PRINTX  #FMT4,#DH7,#DH8
   (9)  016610  012746  014451                                    MOV     #DH8,-(SP)
   (8)  016614  012746  014417                                    MOV     #DH7,-(SP)
   (7)  016620  012746  011522                                    MOV     #FMT4,-(SP)
   (6)  016624  012746  000003                                    MOV     #3,-(SP)
   (3)  016630  010600                                            MOV     SP,R0
   (4)  016632  104415                                            TRAP    C$PNTX
   (4)  016634  062706  000010                                    ADD     #10,SP
7694    016640                      PRINTX  #FMT5,AX0.15,AX0.16,AX1.15,AX1.16
  (11)  016640  013746  002330                                    MOV     AX1.16,-(SP)
  (10)  016644  013746  002326                                    MOV     AX1.15,-(SP)
   (9)  016650  013746  002324                                    MOV     AX0.16,-(SP)
   (8)  016654  013746  002322                                    MOV     AX0.15,-(SP)
   (7)  016660  012746  011535                                    MOV     #FMT5,-(SP)
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   (6)  016664  012746  000005                                                    MOV     #5,-(SP)
   (3)  016670  010600                                                            MOV     SP,R0
   (4)  016672  104415                                                            TRAP    C$PNTX
   (4)  016674  062706  000014                                                    ADD     #14,SP
 7695   016700                        PRINTX  #FMT9,#DH9
   (8)  016700  012746  014510                                                    MOV     #DH9,-(SP)
   (7)  016704  012746  011664                                                    MOV     #FMT9,-(SP)
   (6)  016710  012746  000002                                                    MOV     #2,-(SP)
   (3)  016714  010600                                                            MOV     SP,R0
   (4)  016716  104415                                                            TRAP    C$PNTX
   (4)  016720  062706  000006                                                    ADD     #6,SP
 7696   016724                        PRINTX  #FMT6,AX2.15,AX2.16,AX3.15,AX3.16
  (11)  016724  013746  002340                                                    MOV     AX3.16,-(SP)
  (10)  016730  013746  002336                                                    MOV     AX3.15,-(SP)
   (9)  016734  013746  002334                                                    MOV     AX2.16,-(SP)
   (8)  016740  013746  002332                                                    MOV     AX2.15,-(SP)
   (7)  016744  012746  011565                                                    MOV     #FMT6,-(SP)
   (6)  016750  012746  000005                                                    MOV     #5,-(SP)
   (3)  016754  010600                                                            MOV     SP,R0
   (4)  016756  104415                                                            TRAP    C$PNTX
   (4)  016760  062706  000014                                                    ADD     #14,SP
 7697   016764                        ENDMSG
   (3)  016764                                                          L10006:
   (3)  016764  104423                                                            TRAP    C$MSG
 7698
 7699
 7700
 7701
 7702
 7703   016766                        BGNMSG  ERR6
   (3)  016766                                                          ERR6::
 7704   016766                        PRINTB  #FMT10,SUBRPC
   (8)  016766  013746  002352                                                    MOV     SUBRPC,-(SP)
   (7)  016772  012746  011671                                                    MOV     #FMT10,-(SP)
   (6)  016776  012746  000002                                                    MOV     #2,-(SP)
   (3)  017002  010600                                                            MOV     SP,R0
   (4)  017004  104414                                                            TRAP    C$PNTB
   (4)  017006  062706  000006                                                    ADD     #6,SP
 7705   017012                        PRINTB  #FMT1,#ADDRES,MPCSR
   (9)  017012  013746  002446                                                    MOV     MPCSR,-(SP)
   (8)  017016  012746  035560                                                    MOV     #ADDRES,-(SP)
   (7)  017022  012746  011426                                                    MOV     #FMT1,-(SP)
   (6)  017026  012746  000003                                                    MOV     #3,-(SP)
   (3)  017032  010600                                                            MOV     SP,R0
   (4)  017034  104414                                                            TRAP    C$PNTB
   (4)  017036  062706  000010                                                    ADD     #10,SP
 7706   017042                        PRINTB  #FMT2
   (7)  017042  012746  011436                                                    MOV     #FMT2,-(SP)
   (6)  017046  012746  000001                                                    MOV     #1,-(SP)
   (3)  017052  010600                                                            MOV     SP,R0
   (4)  017054  104414                                                            TRAP    C$PNTB
   (4)  017056  062706  000004                                                    ADD     #4,SP
 7707   017062                        PRINTB  #FMT8,TMP1,TMP0
   (9)  017062  013746  002530                                                    MOV     TMP0,-(SP)
   (8)  017066  013746  002532                                                    MOV     TMP1,-(SP)
   (7)  017072  012746  011630                                                    MOV     #FMT8,-(SP)
```

```
  (6)  017076  012746  000003                                    MOV     #3,-(SP)
  (3)  017102  010600                                            MOV     SP,R0
  (4)  017104  104414                                            TRAP    C$PNTB
  (4)  017106  062706  000010                                    ADD     #10,SP
7708   017112                      PRINTX  #FMT4,#DH2,#DH3
  (9)  017112  012746  014311                                    MOV     #DH3,-(SP)
  (8)  017116  012746  014262                                    MOV     #DH2,-(SP)
  (7)  017122  012746  011522                                    MOV     #FMT4,-(SP)
  (6)  017126  012746  000003                                    MOV     #3,-(SP)
  (3)  017132  010600                                            MOV     SP,R0
  (4)  017134  104415                                            TRAP    C$PNTX
  (4)  017136  062706  000010                                    ADD     #10,SP
7709   017142                      PRINTX  #FMT5,LUR10,LUR11,LUR12,LUR13
  (11) 017142  013746  002310                                    MOV     LUR13,-(SP)
  (10) 017146  013746  002306                                    MOV     LUR12,-(SP)
  (9)  017152  013746  002304                                    MOV     LUR11,-(SP)
  (8)  017156  013746  002302                                    MOV     LUR10,-(SP)
  (7)  017162  012746  011535                                    MOV     #FMT5,-(SP)
  (6)  017166  012746  000005                                    MOV     #5,-(SP)
  (3)  017172  010600                                            MOV     SP,R0
  (4)  017174  104415                                            TRAP    C$PNTX
  (4)  017176  062706  000014                                    ADD     #14,SP
7710   017202                      PRINTX  #FMT9,#DH4
  (8)  017202  012746  014347                                    MOV     #DH4,-(SP)
  (7)  017206  012746  011664                                    MOV     #FMT9,-(SP)
  (6)  017212  012746  000002                                    MOV     #2,-(SP)
  (3)  017216  010600                                            MOV     SP,R0
  (4)  017220  104415                                            TRAP    C$PNTX
  (4)  017222  062706  000006                                    ADD     #6,SP
7711   017226                      PRINTX  #FMT6,LUR14,LUR15,LUR16,LUR17
  (11) 017226  013746  002320                                    MOV     LUR17,-(SP)
  (10) 017232  013746  002316                                    MOV     LUR16,-(SP)
  (9)  017236  013746  002314                                    MOV     LUR15,-(SP)
  (8)  017242  013746  002312                                    MOV     LUR14,-(SP)
  (7)  017246  012746  011565                                    MOV     #FMT6,-(SP)
  (6)  017252  012746  000005                                    MOV     #5,-(SP)
  (3)  017256  010600                                            MOV     SP,R0
  (4)  017260  104415                                            TRAP    C$PNTX
  (4)  017262  062706  000014                                    ADD     #14,SP
7712   017266                      PRINTX  #FMT4,#DH7,#DH8
  (9)  017266  012746  014451                                    MOV     #DH8,-(SP)
  (8)  017272  012746  014417                                    MOV     #DH7,-(SP)
  (7)  017276  012746  011522                                    MOV     #FMT4,-(SP)
  (6)  017302  012746  000003                                    MOV     #3,-(SP)
  (3)  017306  010600                                            MOV     SP,R0
  (4)  017310  104415                                            TRAP    C$PNTX
  (4)  017312  062706  000010                                    ADD     #10,SP
7713   017316                      PRINTX  #FMT5,AX0.15,AX0.16,AX1.15,AX1.16
  (11) 017316  013746  002330                                    MOV     AX1.16,-(SP)
  (10) 017322  013746  002326                                    MOV     AX1.15,-(SP)
  (9)  017326  013746  002324                                    MOV     AX0.16,-(SP)
  (8)  017332  013746  002322                                    MOV     AX0.15,-(SP)
  (7)  017336  012746  011535                                    MOV     #FMT5,-(SP)
  (6)  017342  012746  000005                                    MOV     #5,-(SP)
  (3)  017346  010600                                            MOV     SP,R0
  (4)  017350  104415                                            TRAP    C$PNTX
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  (4)  017352  062706  000014                                                    ADD     #14,SP
7714   017356                        PRINTX  #FMT9,#DH9
  (8)  017356  012746  014510                                                    MOV     #DH9,-(SP)
  (7)  017362  012746  011664                                                    MOV     #FMT9,-(SP)
  (6)  017366  012746  000002                                                    MOV     #2,-(SP)
  (3)  017372  010600                                                            MOV     SP,R0
  (4)  017374  104415                                                            TRAP    C$PNTX
  (4)  017376  062706  000006                                                    ADD     #6,SP
7715   017402                        PRINTX  #FMT6,AX2.15,AX2.16,AX3.15,AX3.16
  (11) 017402  013746  002340                                                    MOV     AX3.16,-(SP)
  (10) 017406  013746  002336                                                    MOV     AX3.15,-(SP)
  (9)  017412  013746  002334                                                    MOV     AX2.16,-(SP)
  (8)  017416  013746  002332                                                    MOV     AX2.15,-(SP)
  (7)  017422  012746  011565                                                    MOV     #FMT6,-(SP)
  (6)  017426  012746  000005                                                    MOV     #5,-(SP)
  (3)  017432  010600                                                            MOV     SP,R0
  (4)  017434  104415                                                            TRAP    C$PNTX
  (4)  017436  062706  000014                                                    ADD     #14,SP
7716   017442                        ENDMSG
  (3)  017442                                                           L10007:
  (3)  017442  104423                                                            TRAP    C$MSG
7717
7718
7719
7720
7721
7722   017444                        BGNMSG  ERR7
  (3)  017444                                                           ERR7::
7723   017444                        PRINTB  #FMT1,#ADDRES,MPCSR
  (9)  017444  013746  002446                                                    MOV     MPCSR,-(SP)
  (8)  017450  012746  035560                                                    MOV     #ADDRES,-(SP)
  (7)  017454  012746  011426                                                    MOV     #FMT1,-(SP)
  (6)  017460  012746  000003                                                    MOV     #3,-(SP)
  (3)  017464  010600                                                            MOV     SP,R0
  (4)  017466  104414                                                            TRAP    C$PNTB
  (4)  017470  062706  000010                                                    ADD     #10,SP
7724   017474                        PRINTB  #FMT2
  (7)  017474  012746  011436                                                    MOV     #FMT2,-(SP)
  (6)  017500  012746  000001                                                    MOV     #1,-(SP)
  (3)  017504  010600                                                            MOV     SP,R0
  (4)  017506  104414                                                            TRAP    C$PNTB
  (4)  017510  062706  000004                                                    ADD     #4,SP
7725   017514                        PRINTB  #FMT7,#DH1,REGNUM
  (9)  017514  013746  002400                                                    MOV     REGNUM,-(SP)
  (8)  017520  012746  014240                                                    MOV     #DH1,-(SP)
  (7)  017524  012746  011620                                                    MOV     #FMT7,-(SP)
  (6)  017530  012746  000003                                                    MOV     #3,-(SP)
  (3)  017534  010600                                                            MOV     SP,R0
  (4)  017536  104414                                                            TRAP    C$PNTB
  (4)  017540  062706  000010                                                    ADD     #10,SP
7726   017544                        PRINTX  #FMT4,#DH2,#DH3
  (9)  017544  012746  014311                                                    MOV     #DH3,-(SP)
  (8)  017550  012746  014262                                                    MOV     #DH2,-(SP)
  (7)  017554  012746  011522                                                    MOV     #FMT4,-(SP)
  (6)  017560  012746  000003                                                    MOV     #3,-(SP)
  (3)  017564  010600                                                            MOV     SP,R0
```

```
  (4)  017566  104415
  (4)  017570  062706  000010
7727   017574                    PRINTX  #FMT5,LUR10,LUR11,LUR12,LUR13
 (11)  017574  013746  002310
 (10)  017600  013746  002306
  (9)  017604  013746  002304
  (8)  017610  013746  002302
  (7)  017614  012746  011535
  (6)  017620  012746  000005
  (3)  017624  010600
  (4)  017626  104415
  (4)  017630  062706  000014
7728   017634                    PRINTX  #FMT9,#DH4
  (8)  017634  012746  014347
  (7)  017640  012746  011664
  (6)  017644  012746  000002
  (3)  017650  010600
  (4)  017652  104415
  (4)  017654  062706  000006
7729   017660                    PRINTX  #FMT6,LUR14,LUR15,LUR16,LUR17
 (11)  017660  013746  002320
 (10)  017664  013746  002316
  (9)  017670  013746  002314
  (8)  017674  013746  002312
  (7)  017700  012746  011565
  (6)  017704  012746  000005
  (3)  017710  010600
  (4)  017712  104415
  (4)  017714  062706  000014
7730   017720                    PRINTX  #FMT4,#DH7,#DH8
  (9)  017720  012746  014451
  (8)  017724  012746  014417
  (7)  017730  012746  011522
  (6)  017734  012746  000003
  (3)  017740  010600
  (4)  017742  104415
  (4)  017744  062706  000010
7731   017750                    PRINTX  #FMT5,AX0.15,AX0.16,AX1.15,AX1.16
 (11)  017750  013746  002330
 (10)  017754  013746  002326
  (9)  017760  013746  002324
  (8)  017764  013746  002322
  (7)  017770  012746  011535
  (6)  017774  012746  000005
  (3)  020000  010600
  (4)  020002  104415
  (4)  020004  062706  000014
7732   020010                    PRINTX  #FMT9,#DH9
  (8)  020010  012746  014510
  (7)  020014  012746  011664
  (6)  020020  012746  000002
  (3)  020024  010600
  (4)  020026  104415
  (4)  020030  062706  000006
7733   020034                    PRINTX  #FMT6,AX2.15,AX2.16,AX3.15,AX3.16
 (11)  020034  013746  002340

                                TRAP    C$PNTX
                                ADD     #10,SP

                                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

                                MOV     #DH4,-(SP)
                                MOV     #FMT9,-(SP)
                                MOV     #2,-(SP)
                                MOV     SP,R0
                                TRAP    C$PNTX
                                ADD     #6,SP

                                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

                                MOV     #DH8,-(SP)
                                MOV     #DH7,-(SP)
                                MOV     #FMT4,-(SP)
                                MOV     #3,-(SP)
                                MOV     SP,R0
                                TRAP    C$PNTX
                                ADD     #10,SP

                                MOV     AX1.16,-(SP)
                                MOV     AX1.15,-(SP)
                                MOV     AX0.16,-(SP)
                                MOV     AX0.15,-(SP)
                                MOV     #FMT5,-(SP)
                                MOV     #5,-(SP)
                                MOV     SP,R0
                                TRAP    C$PNTX
                                ADD     #14,SP

                                MOV     #DH9,-(SP)
                                MOV     #FMT9,-(SP)
                                MOV     #2,-(SP)
                                MOV     SP,R0
                                TRAP    C$PNTX
                                ADD     #6,SP

                                MOV     AX3.16,-(SP)
```

```
   (10) 020040  013746  002336                                                  MOV     AX3.15,-(SP)
   (9)  020044  013746  002334                                                  MOV     AX2.16,-(SP)
   (8)  020050  013746  002332                                                  MOV     AX2.15,-(SP)
   (7)  020054  012746  011565                                                  MOV     #FMT6,-(SP)
   (6)  020060  012746  000005                                                  MOV     #5,-(SP)
   (3)  020064  010600                                                          MOV     SP,R0
   (4)  020066  104415                                                          TRAP    C$PNTX
   (4)  020070  062706  000014                                                  ADD     #14,SP
 7734   020074                        ENDMSG
   (3)  020074                                                          L10010:
   (3)  020074  104423                                                          TRAP    C$MSG
 7735
 7736
 7737
 7738
 7739
 7740   020076                        BGNMSG  ERR8
   (3)  020076                                                          ERR8::
 7741   020076                        PRINTB  #FMT10,SUBRPC
   (8)  020076  013746  002352                                                  MOV     SUBRPC,-(SP)
   (7)  020102  012746  011671                                                  MOV     #FMT10,-(SP)
   (6)  020106  012746  000002                                                  MOV     #2,-(SP)
   (3)  020112  010600                                                          MOV     SP,R0
   (4)  020114  104414                                                          TRAP    C$PNTB
   (4)  020116  062706  000006                                                  ADD     #6,SP
 7742   020122                        PRINTB  #FMT1,#ADDRES,MPCSR
   (9)  020122  013746  002446                                                  MOV     MPCSR,-(SP)
   (8)  020126  012746  035560                                                  MOV     #ADDRES,-(SP)
   (7)  020132  012746  011426                                                  MOV     #FMT1,-(SP)
   (6)  020136  012746  000003                                                  MOV     #3,-(SP)
   (3)  020142  010600                                                          MOV     SP,R0
   (4)  020144  104414                                                          TRAP    C$PNTB
   (4)  020146  062706  000010                                                  ADD     #10,SP
 7743   020152                        PRINTB  #FMT2
   (7)  020152  012746  011436                                                  MOV     #FMT2,-(SP)
   (6)  020156  012746  000001                                                  MOV     #1,-(SP)
   (3)  020162  010600                                                          MOV     SP,R0
   (4)  020164  104414                                                          TRAP    C$PNTB
   (4)  020166  062706  000004                                                  ADD     #4,SP
 7744   020172                        PRINTB  #FMT7,#DH1,REGNUM
   (9)  020172  013746  002400                                                  MOV     REGNUM,-(SP)
   (8)  020176  012746  014240                                                  MOV     #DH1,-(SP)
   (7)  020202  012746  011620                                                  MOV     #FMT7,-(SP)
   (6)  020206  012746  000003                                                  MOV     #3,-(SP)
   (3)  020212  010600                                                          MOV     SP,R0
   (4)  020214  104414                                                          TRAP    C$PNTB
   (4)  020216  062706  000010                                                  ADD     #10,SP
 7745   020222                        PRINTB  #FMT3,GOODAT,BADDAT
   (9)  020222  013746  002406                                                  MOV     BADDAT,-(SP)
   (8)  020226  013746  002404                                                  MOV     GOODAT,-(SP)
   (7)  020232  012746  011460                                                  MOV     #FMT3,-(SP)
   (6)  020236  012746  000003                                                  MOV     #3,-(SP)
   (3)  020242  010600                                                          MOV     SP,R0
   (4)  020244  104414                                                          TRAP    C$PNTB
   (4)  020246  062706  000010                                                  ADD     #10,SP
 7746   020252                        PRINTX  #FMT4,#DH2,#DH3
```

```
  (9)  020252  012746  014311                                    MOV     #DH3,-(SP)
  (8)  020256  012746  014262                                    MOV     #DH2,-(SP)
  (7)  020262  012746  011522                                    MOV     #FMT4,-(SP)
  (6)  020266  012746  000003                                    MOV     #3,-(SP)
  (3)  020272  010600                                            MOV     SP,R0
  (4)  020274  104415                                            TRAP    C$PNTX
  (4)  020276  062706  000010                                    ADD     #10,SP
7747   020302                  PRINTX  #FMT5,LUR10,LUR11,LUR12,LUR13
 (11)  020302  013746  002310                                    MOV     LUR13,-(SP)
 (10)  020306  013746  002306                                    MOV     LUR12,-(SP)
  (9)  020312  013746  002304                                    MOV     LUR11,-(SP)
  (8)  020316  013746  002302                                    MOV     LUR10,-(SP)
  (7)  020322  012746  011535                                    MOV     #FMT5,-(SP)
  (6)  020326  012746  000005                                    MOV     #5,-(SP)
  (3)  020332  010600                                            MOV     SP,R0
  (4)  020334  104415                                            TRAP    C$PNTX
  (4)  020336  062706  000014                                    ADD     #14,SP
7748   020342                  PRINTX  #FMT9,#DH4
  (8)  020342  012746  014347                                    MOV     #DH4,-(SP)
  (7)  020346  012746  011664                                    MOV     #FMT9,-(SP)
  (6)  020352  012746  000002                                    MOV     #2,-(SP)
  (3)  020356  010600                                            MOV     SP,R0
  (4)  020360  104415                                            TRAP    C$PNTX
  (4)  020362  062706  000006                                    ADD     #6,SP
7749   020366                  PRINTX  #FMT6,LUR14,LUR15,LUR16,LUR17
 (11)  020366  013746  002320                                    MOV     LUR17,-(SP)
 (10)  020372  013746  002316                                    MOV     LUR16,-(SP)
  (9)  020376  013746  002314                                    MOV     LUR15,-(SP)
  (8)  020402  013746  002312                                    MOV     LUR14,-(SP)
  (7)  020406  012746  011565                                    MOV     #FMT6,-(SP)
  (6)  020412  012746  000005                                    MOV     #5,-(SP)
  (3)  020416  010600                                            MOV     SP,R0
  (4)  020420  104415                                            TRAP    C$PNTX
  (4)  020422  062706  000014                                    ADD     #14,SP
7750   020426                  PRINTX  #FMT4,#DH7,#DH8
  (9)  020426  012746  014451                                    MOV     #DH8,-(SP)
  (8)  020432  012746  014417                                    MOV     #DH7,-(SP)
  (7)  020436  012746  011522                                    MOV     #FMT4,-(SP)
  (6)  020442  012746  000003                                    MOV     #3,-(SP)
  (3)  020446  010600                                            MOV     SP,R0
  (4)  020450  104415                                            TRAP    C$PNTX
  (4)  020452  062706  000010                                    ADD     #10,SP
7751   020456                  PRINTX  #FMT5,AX0.15,AX0.16,AX1.15,AX1.16
 (11)  020456  013746  002330                                    MOV     AX1.16,-(SP)
 (10)  020462  013746  002326                                    MOV     AX1.15,-(SP)
  (9)  020466  013746  002324                                    MOV     AX0.16,-(SP)
  (8)  020472  013746  002322                                    MOV     AX0.15,-(SP)
  (7)  020476  012746  011535                                    MOV     #FMT5,-(SP)
  (6)  020502  012746  000005                                    MOV     #5,-(SP)
  (3)  020506  010600                                            MOV     SP,R0
  (4)  020510  104415                                            TRAP    C$PNTX
  (4)  020512  062706  000014                                    ADD     #14,SP
7752   020516                  PRINTX  #FMT9,#DH9
  (8)  020516  012746  014510                                    MOV     #DH9,-(SP)
  (7)  020522  012746  011664                                    MOV     #FMT9,-(SP)
  (6)  020526  012746  000002                                    MOV     #2,-(SP)
```

```
  (3)  020532  010600
  (4)  020534  104415
  (4)  020536  062706  000006
7753   020542
 (11)  020542  013746  002340
 (10)  020546  013746  002336
  (9)  020552  013746  002334
  (8)  020556  013746  002332
  (7)  020562  012746  011565
  (6)  020566  012746  000005
  (3)  020572  010600
  (4)  020574  104415
  (4)  020576  062706  000014
7754   020602                    PRINTX  #FMT6,AX2.15,AX2.16,AX3.15,AX3.16
  (3)  020602                                                                MOV     SP,R0
  (3)  020602  104423                                                        TRAP    C$PNTX
                                                                             ADD     #6,SP
                                                                             MOV     AX3.16,-(SP)
                                                                             MOV     AX3.15,-(SP)
                                                                             MOV     AX2.16,-(SP)
                                                                             MOV     AX2.15,-(SP)
                                                                             MOV     #FMT6,-(SP)
                                                                             MOV     #5,-(SP)
                                                                             MOV     SP,R0
                                                                             TRAP    C$PNTX
                                                                             ADD     #14,SP
                           ENDMSG
                                                                  L10011:
                                                                             TRAP    C$MSG
7755
7756
7757
7758
7759
7760   020604                    BGNMSG  ERR9
  (3)  020604                                                      ERR9::
7761   020604                    PRINTB  #FMT1,#ADDRES,MPCSR
  (9)  020604  013746  002446                                                MOV     MPCSR,-(SP)
  (8)  020610  012746  035560                                                MOV     #ADDRES,-(SP)
  (7)  020614  012746  011426                                                MOV     #FMT1,-(SP)
  (6)  020620  012746  000003                                                MOV     #3,-(SP)
  (3)  020624  010600                                                        MOV     SP,R0
  (4)  020626  104414                                                        TRAP    C$PNTB
  (4)  020630  062706  000010                                                ADD     #10,SP
7762   020634                    PRINTB  #FMT2
  (7)  020634  012746  011436                                                MOV     #FMT2,-(SP)
  (6)  020640  012746  000001                                                MOV     #1,-(SP)
  (3)  020644  010600                                                        MOV     SP,R0
  (4)  020646  104414                                                        TRAP    C$PNTB
  (4)  020650  062706  000004                                                ADD     #4,SP
7763   020654                    PRINTB  #FMT7,#DH1,REGNUM
  (9)  020654  013746  002400                                                MOV     REGNUM,-(SP)
  (8)  020660  012746  014240                                                MOV     #DH1,-(SP)
  (7)  020664  012746  011620                                                MOV     #FMT7,-(SP)
  (6)  020670  012746  000003                                                MOV     #3,-(SP)
  (3)  020674  010600                                                        MOV     SP,R0
  (4)  020676  104414                                                        TRAP    C$PNTB
  (4)  020700  062706  000010                                                ADD     #10,SP
7764   020704                    PRINTX  #FMT4,#DH2,#DH3
  (9)  020704  012746  014311                                                MOV     #DH3,-(SP)
  (8)  020710  012746  014262                                                MOV     #DH2,-(SP)
  (7)  020714  012746  011522                                                MOV     #FMT4,-(SP)
  (6)  020720  012746  000003                                                MOV     #3,-(SP)
  (3)  020724  010600                                                        MOV     SP,R0
  (4)  020726  104415                                                        TRAP    C$PNTX
  (4)  020730  062706  000010                                                ADD     #10,SP
7765   020734                    PRINTX  #FMT5,LUR10,LUR11,LUR12,LUR13
 (11)  020734  013746  002310                                                MOV     LUR13,-(SP)
 (10)  020740  013746  002306                                                MOV     LUR12,-(SP)
```

```
  (9)  020744  013746  002304                                                  MOV     LUR11,-(SP)
  (8)  020750  013746  002302                                                  MOV     LUR10,-(SP)
  (7)  020754  012746  011535                                                  MOV     #FMT5,-(SP)
  (6)  020760  012746  000005                                                  MOV     #5,-(SP)
  (3)  020764  010600                                                          MOV     SP,R0
  (4)  020766  104415                                                          TRAP    C$PNTX
  (4)  020770  062706  000014                                                  ADD     #14,SP
7766   020774                       PRINTX  #FMT9,#DH4
  (8)  020774  012746  014347                                                  MOV     #DH4,-(SP)
  (7)  021000  012746  011664                                                  MOV     #FMT9,-(SP)
  (6)  021004  012746  000002                                                  MOV     #2,-(SP)
  (3)  021010  010600                                                          MOV     SP,R0
  (4)  021012  104415                                                          TRAP    C$PNTX
  (4)  021014  062706  000006                                                  ADD     #6,SP
7767   021020                       PRINTX  #FMT6,LUR14,LUR15,LUR16,LUR17
  (11) 021020  013746  002320                                                  MOV     LUR17,-(SP)
  (10) 021024  013746  002316                                                  MOV     LUR16,-(SP)
  (9)  021030  013746  002314                                                  MOV     LUR15,-(SP)
  (8)  021034  013746  002312                                                  MOV     LUR14,-(SP)
  (7)  021040  012746  011565                                                  MOV     #FMT6,-(SP)
  (6)  021044  012746  000005                                                  MOV     #5,-(SP)
  (3)  021050  010600                                                          MOV     SP,R0
  (4)  021052  104415                                                          TRAP    C$PNTX
  (4)  021054  062706  000014                                                  ADD     #14,SP
7768   021060                       ENDMSG
  (3)  021060                                                          L10012:
  (3)  021060  104423                                                          TRAP    C$MSG
7769
7770
7771
7772
7773
```

```
                                .SBTTL  REPORT CODING SECTION


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

021062                                  BGNRPT
(3) 021062                                                                      L$RPT::
021062                                  ENDRPT
(3) 021062                                                                      L10013:
(3) 021062  104425                                                                      TRAP    C$RPT
```

```
                                .SBTTL  LOAD DEVICE PROTECTION TABLE

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

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

```
                        .SBTTL  INITIALIZE SECTION

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

                                BGNINIT
                                                                        L$INIT::

                                MOV     SP,PSTACK       ;SAVE BASE-LEVEL STACK POINTER
                                CLR     SUBRPC          ;CLEAR SUBR CALL PC
                                CLR     DISILO          ;CLEAR CURRENT STATE OF DISSI
                                CLR     CHPTYP          ;CLEAR USYRT CHIP TYPE INDICATOR
                                CLR     ERROR1          ;CLEAR ERROR FLAG
                                CLR     SAVLEN          ;CLEAR CHAR LENGTH FROM SETUP
                                TST     FRSTIM          ;SEE IF FIRST TIME THROUGH AFTER LOAD
                                BNE     6$              ;BR IF NOT
                                MOV     @#4,SAVE4       ;SAVE ERROR TRAP VECTOR
                                MOV     @#6,SAVE6
                                BR      9$
6$:                             MOV     SAVE4,@#4       ;RESTORE ERROR TRAP VECTOR
                                MOV     SAVE6,@#6
9$:                             MOV     #1,FRSTIM       ;MARK FLAG FOR NEXT TIME THROUGH
                        ;SEE IF PROGRAM JUST STARTED, BR IF YES
                                READEF  #EF.START
                                                                        MOV     #EF.START,R0
                                                                        TRAP    C$REFG
                                BCOMPLETE       STARST
                                                                        BCS     STARST
                        ;SEE IF PROGRAM JUST RESTARTED, BR IF YES
                                READEF  #EF.RESTART
                                                                        MOV     #EF.RESTART,R0
                                                                        TRAP    C$REFG
                                BCOMPLETE       STARST
                                                                        BCS     STARST
                        ;SEE IF THIS IS A NEW PASS, BR IF YES
                                READEF  #EF.NEW
                                                                        MOV     #EF.NEW,R0
                                                                        TRAP    C$REFG
                                BCOMPLETE       NEWST
                                                                        BCS     NEWST
                        ;SEE IF PROGRAM WAS JUST CONTINUED
                                READEF  #EF.CONTINUE
                                                                        MOV     #EF.CONTINUE,R0
                                                                        TRAP    C$REFG
                                BCOMPLETE       ENDIT
                                                                        BCS     ENDIT
                                BR      GETPRM
STARST:
                                CLR     STARES          ;CLEAR FLAG TO SHOW JUST HAD STA OR RES
                        ;CLEAR DEVICE MAP
                                CLR     DEVMAP
NEWST:
                                MOV     #-1,LOGDEV      ;RESET LOGICAL DEVICE TO -1
                                INC     STARES          ;INCR NO. OF PASSES SINCE STA OR RES
```

```
7853  021254  012737  000001  002436          MOV     #BIT0,DEVPTR    ;INIT DEVICE MAP BIT POINTER
7854                                    ; GET UNIBUS ADDRESS, VECTOR, PRIORITY LEVEL, SWITCH PACKS, TEST
7855                                    ;   CONNECTOR INFORMATION FOR THIS LOGICAL DEVICE
7856  021262                            GETPRM:
7857  021262  005237  002344                  INC     LOGDEV          ;INCREMENT LOGICAL DEVICE NUMBER
7858  021266  023737  002344  002012        CMP     LOGDEV,L$UNIT   ;SEE IF MAXIMUM UNIT NO. EXCEEDED
7859  021274  002362                        BGE     NEWST           ;BR IF YES
7860  021276                              GPHARD  LOGDEV,R1       ;GET P-TABLE POINTER INTO R1
 (3)  021276  013700  002344                                                    MOV     LOGDEV,R0
 (3)  021302  104442                                                            TRAP    C$GPHRD
 (3)  021304  010001                                                            MOV     R0,R1
7861  021306                              BCOMPLETE       10$     ;BR IF DEVICE AVAILABLE
 (2)  021306  103403                                                            BCS     10$
7862  021310  006337  002436                  ASL     DEVPTR          ;SHIFT DEVICE POINTER
7863  021314  000762                        BR      GETPRM          ;SKIP THIS DEVICE
7864  021316  053737  002436  002434  10$:  BIS     DEVPTR,DEVMAP   ;SET BIT FOR THIS DEVICE
7865  021324  006337  002436                  ASL     DEVPTR          ;SHIFT BIT POINTER
7866  021330  062701  000002                  ADD     #2,R1           ;INCREMENT R1 PAST MICROPROCESSOR TYPE
7867  021334  011137  002446                  MOV     (R1),MPCSR      ;STORE POINTER TO MICROPROCESSOR CSR'S
7868  021340  011137  002450                  MOV     (R1),BSEL1
7869  021344  005237  002450                  INC     BSEL1           ;GET POINTER TO BSEL1 (MAINTENANCE REGISTER)
7870  021350  013737  002450  002452        MOV     BSEL1,BSEL2
7871  021356  005237  002452                  INC     BSEL2           ;GET POINTER TO BSEL2
7872  021362  011137  002454                  MOV     (R1),SEL4
7873  021366  062737  000004  002454        ADD     #4,SEL4         ;GET POINTER TO SEL4
7874  021374  012137  002456                  MOV     (R1)+,SEL6
7875  021400  062737  000006  002456        ADD     #6,SEL6         ;STORE POINTER TO SEL6
7876  021406  011137  002460                  MOV     (R1),MPIVEC     ;GET MICROPROCESSOR INPUT INTRPT VECTOR
7877  021412  012137  002462                  MOV     (R1)+,MPOVEC
7878  021416  062737  000004  002462        ADD     #4,MPOVEC       ;GET MICROPROCESSOR OUTPUT INTRPT VECTOR
7879  021424  012137  002464                  MOV     (R1)+,MPRIOR    ;GET MICROPROCESSOR DEVICE PRIORITY
7880  021430  062701  000014                  ADD     #14,R1          ;POINT R1 TO RUN SWITCH INDICATOR
7881  021434  011137  002476                  MOV     (R1),RUNINH     ;GET STATE OF MICROPROCESSOR RUN SWITCH
7882  021440                            ENDIT:
7883  021440                              ENDINIT
 (3)  021440                                                    L10015:
 (3)  021440  104411                                                            TRAP    C$INIT
7884
7885
7886
7887
7888
7889
```

```
                                .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.
                                ;////////////////////////////////////////////////////////////////////////////////
021442                                  BGNAUTO
(3) 021442                                                                              L$AUTO::

                                ;ESTABLISH CPU PRIORITY = 7
021442                                  SETPRI  #PRI07
(3) 021442  012700  000340                                                                      MOV     #PRI07,R0
(3) 021446  104441                                                                              TRAP    C$SPRI
021450  012737  021472  000004        MOV     #6$,@#4         ;SET UP NON-EXISTENT MEMORY ERROR TRAP VECTOR
021456  012737  000340  000006        MOV     #PRI07,@#6
021464  005777  160756                TST     @MPCSR          ;ADDRESS SEL0
021470  000405                        BR      9$              ;TAKE THIS BR IF DEVICE RESPONDS
                                ;COME HERE IF DEVICE CSR IS NON-EXISTENT
021472  062706  000004        6$:     ADD     #4,SP           ;CLEAN UP THE STACK POINTER
021476                                  DODU    LOGDEV          ;DROP THIS UNIT FROM TESTING
(3) 021476  013700  002344                                                                      MOV     LOGDEV,R0
(3) 021502  104451                                                                              TRAP    C$DODU
021504  013737  002414  000004  9$:     MOV     SAVE4,@#4       ;RESTORE ERROR TRAP VECTOR
021512  013737  002416  000006          MOV     SAVE6,@#6
021520                                  ENDAUTO
(3) 021520                                                                              L10016:
(3) 021520  104461                                                                              TRAP    C$AUTO
```

```
                        .SBTTL  CLEANUP CODING SECTION

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

                                BGNCLN
                                                                L$CLEAN::

                                ENDCLN
                                                                L10017:
                                                                        TRAP    C$CLEAN
```

```
                                .SBTTL  DROP UNIT SECTION

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

021524                                  BGNDU
(3) 021524                                                                      L$DU::
                                ;ISSUE UNIBUS RESET TO CLEAN UP
021524                                  BRESET
(3) 021524  104433                                                                      TRAP    C$RESET
                                ;PRINT 'UNIT XX DROPPED''
021526                                  PRINTF  #FMT27,LOGDEV
(8) 021526  013746  002344                                                              MOV     LOGDEV,-(SP)
(7) 021532  012746  021554                                                              MOV     #FMT27,-(SP)
(6) 021536  012746  000002                                                              MOV     #2,-(SP)
(3) 021542  010600                                                                      MOV     SP,R0
(4) 021544  104417                                                                      TRAP    C$PNTF
(4) 021546  062706  000006                                                              ADD     #6,SP
021552                                  ENDDU
(3) 021552                                                                      L10020:
(3) 021552  104453                                                                      TRAP    C$DU

021554  047045  040445  047125  FMT27:  .ASCIZ  /%N%AUNIT %D2%A DROPPED%N/
021562  052111  022440  031104
021570  040445  042040  047522
021576  050120  042105  047045
021604     000
                021606                  .EVEN
```

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

021606                                  BGNAU
(3)  021606                                                             L$AU::
021606                                  ENDAU
(3)  021606                                                             L10021:
(3)  021606  104452                                                             TRAP    C$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.
                        ;;*****************************************************************************
021610                  BGNTST
(3) 021610                                                                      T1::
                        ;ESTABLISH CPU PRIORITY = 7
021610                          SETPRI  #PRI07
(3) 021610  012700  000340                                                      MOV     #PRI07,R0
(3) 021614  104441                                                              TRAP    C$SPRI
021616  012737  021640  000004          MOV     #6$,@#4         ;SET UP NON-EXISTENT MEMORY ERROR TRAP VECTOR
021624  012737  000340  000006          MOV     #PRI07,@#6
021632  005777  160610                  TST     @MPCSR          ;ADDRESS SEL0
021636  000406                          BR      9$              ;TAKE THIS BR IF DEVICE RESPONDS
                        ;COME HERE IF DEVICE CSR IS NON-EXISTENT
021640  062706  000004          6$:     ADD     #4,SP           ;CLEAN UP THE STACK POINTER
                        ;REPORT CSR ADDRESS TIME-OUT
021644                          ERRDF   1,EM1,ERR1
(4) 021644  104455                                                              TRAP    C$ERDF
(5) 021646  000001                                                              .WORD   1
(5) 021650  012101                                                              .WORD   EM1
(5) 021652  014554                                                              .WORD   ERR1
021654  013737  002414  000004  9$:     MOV     SAVE4,@#4       ;RESTORE ERROR TRAP VECTOR
021662  013737  002416  000006          MOV     SAVE6,@#6
021670                  ENDTST
(3) 021670                                                                              L10022:
(3) 021670  104401                                                                      TRAP    C$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.
                        ;;*****************************************************************************
021672                  BGNTST
(3) 021672                                                                      T2::
021672  012737  000014  002400          MOV     #14,REGNUM      ;SET LU REG NO. = 14
021700  004737  003576                  JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
021704  004737  003644                  JSR     PC,READLU       ;READ REG 14
021710  123737  002364  003026          CMPB    REDBYT,PATM+4   ;CHK FOR INITIALIZED STATE
021716  001416                          BEQ     6$              ;BR IF YES
021720  005037  002404                  CLR     GOODAT          ;SET EXPECTED REG CONTENTS = 000
021724  113737  003026  002404          MOVB    PATM+4,GOODAT   ;SET EXPECTED DATA
```

```
 8018  021732  013737  002364  002406          MOV     REDBYT,BADDAT   ;SET ACTUAL REG CONTENTS
 8019  021740  004737  003770                  JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
 8020                                  ;REPORT REG NOT CLEARED BY MASTER CLEAR
 8021  021744                                  ERRDF   2,EM2,ERR2
  (4)  021744  104455                                                             TRAP    C$ERDF
  (5)  021746  000002                                                             .WORD   2
  (5)  021750  012135                                                             .WORD   EM2
  (5)  021752  014606                                                             .WORD   ERR2
 8022  021754                          6$:
 8023  021754                          ENDTST
  (3)  021754                                                                 L10023:
  (3)  021754  104401                                                             TRAP    C$ETST
 8024
 8025
 8026
 8027
 8028
 8029                                  ;;*****************************************************************************
 8030                                  .SBTTL      TEST 3 - INBUS/OUTBUS REG 14 READ/WRITE BIT TEST
 8031                                  ;*
 8032                                  ;* WRITE, READ, AND COMPARE ALL WORDS OF DATA PATTERN A INTO REG 14,
 8033                                  ;* A BYTE AT A TIME. NON-R/W BITS ARE MASKED OFF TO 0 BEFORE WRITING AND
 8034                                  ;* READING.
 8035                                  ;*    DATA PATTERN A = 125,252,000,377,001,002,004,010,020,040,100,200,376,
 8036                                  ;*                     375,373,367,357,337,277,177.
 8037                                  ;;*****************************************************************************
 8038  021756                          BGNTST
  (3)  021756                                                                 T3::
 8039  021756  004737  003576                  JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
 8040  021762  012737  000014  002400          MOV     #14,REGNUM      ;SET LU REG NO. = 14
 8041  021770  012701  002571                  MOV     #PATA,R1        ;GET POINTER TO DATA PAT IN R1
 8042  021774                          3$:
 8043  021774                                  BGNSEG
  (3)  021774  104404                                                             TRAP    C$BSEG
 8044  021776  111137  002366                  MOVB    (R1),WRIBYT     ;GET A BYTE OF PAT A
 8045  022002  143737  002560  002366          BICB    R14NRW,WRIBYT   ;MASK OFF NON-READ/WRITE BITS
 8046  022010  004737  003722                  JSR     PC,WRITLU       ;WRITE DATA BYTE INTO REG 14
 8047  022014  004737  003644                  JSR     PC,READLU       ;READ DATA BYTE FROM REG 14
 8048  022020  143737  002560  002364          BICB    R14NRW,REDBYT   ;MASK OFF NON-READ/WRITE BITS
 8049  022026  123737  002364  002366          CMPB    REDBYT,WRIBYT   ;COMPARE BYTE READ TO BYTE WRITTEN
 8050  022034  001414                          BEQ     6$              ;BR IF BYTES MATCH
 8051  022036  013737  002366  002404          MOV     WRIBYT,GOODAT   ;SET EXPECTED REG CONTENTS
 8052  022044  013737  002364  002406          MOV     REDBYT,BADDAT   ;SET ACTUAL REG CONTENTS
 8053  022052  004737  003770                  JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
 8054                                  ;REPORT LINE UNIT REG MISCOMPARE
 8055  022056                                  ERRDF   3,EM3,ERR2
  (4)  022056  104455                                                             TRAP    C$ERDF
  (5)  022060  000003                                                             .WORD   3
  (5)  022062  012174                                                             .WORD   EM3
  (5)  022064  014606                                                             .WORD   ERR2
 8056  022066                          6$:
 8057  022066                                  ENDSEG
  (3)  022066                                                                 10000$:
  (3)  022066  104405                                                             TRAP    C$ESEG
 8058  022070  005201                  INC     R1              ;INCREMENT DATA PATTERN POINTER
 8059  022072  020127  002615          CMP     R1,#PATB        ;SEE IF ALL WORDS OF PATTERN A USED YET
```

```
 8060  022076  103736                        BLO     3$              ;BR IF NOT DONE YET
 8061  022100                          ENDTST
  (3)  022100                                                                  L10024:
  (3)  022100  104401                                                                  TRAP    C$ETST
 8062
 8063
 8064
 8065
 8066
 8067                                  ;;*************************************************************************************
 8068                                  .SBTTL      TEST 4 - REG 14 MASTER CLEAR TEST
 8069                                  ;* WRITE 377 INTO REG 14, ISSUE MASTER CLEAR, READ REG 14 AND COMPARE
 8070                                  ;* TO 200.
 8071                                  ;;*************************************************************************************
 8072  022102                          BGNTST
  (3)  022102                                                                  T4::
 8073  022102  004737  003576                  JSR     PC,MSTCLR       ;PERFORM MASTER CLEAR
 8074  022106  012737  000014  002400          MOV     #14,REGNUM      ;SET LU REG NO. = 14
 8075  022114  112737  000377  002366          MOVB    #377,WRIBYT     ;SET DATA BYTE = 377
 8076  022122  004737  003722                  JSR     PC,WRITLU       ;WRITE 377 INTO REG 14
 8077  022126  004737  003576                  JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
 8078  022132  004737  003644                  JSR     PC,READLU       ;READ REG 14
 8079  022136  123737  002364  003026          CMPB    REDBYT,PATM+4   ;CHK FOR INIT'D STATE
 8080  022144  001416                          BEQ     6$              ;BR IF REG GOT CLEARED
 8081  022146  005037  002404                  CLR     GOODAT
 8082  022152  113737  003026  002404          MOVB    PATM+4,GOODAT   ;SET EXPECTED DATA
 8083  022160  013737  002364  002406          MOV     REDBYT,BADDAT   ;SET ACTUAL DATA
 8084  022166  004737  003770                  JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
 8085                                  ;REPORT REG NOT CLEARED BY MASTER CLEAR
 8086  022172                                  ERRDF   2,EM2,ERR2
  (4)  022172  104455                                                                  TRAP    C$ERDF
  (5)  022174  000002                                                                  .WORD   2
  (5)  022176  012135                                                                  .WORD   EM2
  (5)  022200  014606                                                                  .WORD   ERR2
 8087  022202                          6$:
 8088  022202                          ENDTST
  (3)  022202                                                                  L10025:
  (3)  022202  104401                                                                  TRAP    C$ETST
 8089
 8090
 8091
 8092
 8093
 8094                                  ;;*************************************************************************************
 8095                                  .SBTTL      TEST 5 - REG 14 UNIBUS RESET (INIT) TEST
 8096                                  ;* WRITE 377 INTO REG 14, ISSUE UNIBUS RESET (INIT), READ REG 14 AND COMPARE
 8097                                  ;* TO 200.
 8098                                  ;;*************************************************************************************
 8099  022204                          BGNTST
  (3)  022204                                                                  T5::
 8100  022204  004737  003576                  JSR     PC,MSTCLR       ;PERFORM MASTER CLEAR
 8101  022210  012737  000014  002400          MOV     #14,REGNUM      ;SET LU REG NO. = 14
 8102  022216  112737  000377  002366          MOVB    #377,WRIBYT     ;SET DATA BYTE = 377
 8103  022224  004737  003722                  JSR     PC,WRITLU       ;WRITE 377 INTO REG 14
 8104  022230                                  BRESET                  ;ISSUE UNIBUS RESET (INIT)
  (3)  022230  104433                                                                  TRAP    C$RESET
```

```
 8105  022232  142777  000200  160210          BICB    #RUN,@BSEL1     ;CLEAR RUN BIT
 8106  022240  012701  000024                  MOV     #20.,R1         ;INIT LOOP COUNTER
 8107  022244  000240                  2$:     NOP
 8108  022246  005301                          DEC     R1              ;DECR COUNTER
 8109  022250  001375                          BNE     2$              ;BR TO STALL
 8110  022252  004737  003644                  JSR     PC,READLU       ;READ REG 14
 8111  022256  123737  002364  003026          CMPB    REDBYT,PATM+4   ;CHK FOR INIT'D STATE
 8112  022264  001416                          BEQ     6$              ;BR IF REG GOT CLEARED
 8113  022266  005037  002404                  CLR     GOODAT
 8114  022272  113737  003026  002404          MOVB    PATM+4,GOODAT   ;SET EXPECTED DATA
 8115  022300  013737  002364  002406          MOV     REDBYT,BADDAT   ;SET ACTUAL DATA
 8116  022306  004737  003770                  JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
 8117                          ;REPORT REG NOT CLEARED BY UNIBUS RESET (INIT)
 8118  022312                  ERRDF   4,EM4,ERR2
   (4) 022312  104455                                                  TRAP    C$ERDF
   (5) 022314  000004                                                  .WOFD   4
   (5) 022316  012213                                                  .WOFD   EM4
   (5) 022320  014606                                                  .WORD   ERR2
 8119  022322                  6$:
 8120  022322                  ENDTST
   (3) 022322                                                  L10026:
   (3) 022322  104401                                                  TRAP    C$ETST
 8121
 8122
 8123
 8124
 8125
 8126                          ;;*****************************************************************************
 8127                          .SBTTL      TEST 6 - LINE UNIT FALSE SELECTION TEST
 8128                          ;*
 8129                          ;* FIRST, A MASTER CLEAR IS PERFORMED. THEN, THE PROGRAM SINGLE-STEPS THE
 8130                          ;* MICROPROCESSOR THROUGH AN INSTRUCTION WHICH LOADS 041 (OCT) INTO THE MAR
 8131                          ;* REGISTER (OBUS* ADRS 14). THEN, THE LINE UNIT REGISTER 14 IS READ AND CHECKED
 8132                          ;* TO BE UNAFFECTED (STILL = 0). THIS TEST IS INTENDED TO DETECT A FALSE
 8133                          ;* SELECTION OF THE LINE UNIT REGISTERS, WHEN THE LINE UNIT IS NOT BEING
 8134                          ;* ACCESSED.
 8135                          ;;*****************************************************************************
 8136  022324                  BGNTST
   (3) 022324                                                          T6::
 8137  022324  004737  003576          JSR     PC,MSTCLR       ;ISSUE A MASTER CLEAR
 8138  022330  012737  000014  002400  MOV     #14,REGNUM      ;SET LU REG NO. = 14
 8139  022336  013701  002400          MOV     REGNUM,R1       ;SET DESTINATION = OBUS* REG 14
 8140  022342  052701  000100          BIS     #100,R1         ;SET SOURCE = BSEL4
 8141  022346  052701  121000          BIS     #MVIXOX,R1      ;SET REST OF MOVE INSTRUCTION
 8142  022352  010137  022370          MOV     R1,2$           ;SET INSTRUCTION AS SUBROUTINE ARGUMENT
 8143  022356  112777  000041  160070  MOVB    #041,@BSEL4     ;SET DATA BYTE = 041
 8144  022364  004737  003540          JSR     PC,STPCLK       ;EXECUTE MOVE INSTRUCTION
 8145  022370  000000          2$:     .WORD   0               ;INSTRUCTION GOES HERE
 8146  022372  004737  003644          JSR     PC,READLU       ;READ LU REG 14
 8147  022376  123737  002364  003026  CMPB    REDBYT,PATM+4   ;CHECK FOR LU REG 14 UNCHANGED
 8148  022404  001416                  BEQ     4$              ;BR IF LU REG 14 UNCHANGED
 8149  022406  005037  002404          CLR     GOODAT          ;SET EXPECTED DATA
 8150  022412  113737  003026  002404  MOVB    PATM+4,GOODAT
 8151  022420  013737  002364  002406  MOV     REDBYT,BADDAT   ;SET ACTUAL DATA
 8152  022426  004737  003770          JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
 8153                          ;REPORT REGISTER MISCOMPARE
```

```
8154  022432                          ERRDF   3,EM3,ERR2
 (4)  022432  104455                                                    TRAP    C$ERDF
 (5)  022434  000003                                                    .WORD   3
 (5)  022436  012174                                                    .WORD   EM3
 (5)  022440  014606                                                    .WORD   ERR2
8155  022442                    4$:
8156  022442                    ENDTST
 (3)  022442                                                        L10027:
 (3)  022442  104401                                                    TRAP    C$ETST
8157
8158
8159
8160
8161
8162                            ;;*************************************************************************************
8163                            .SBTTL      TEST 7 - INBUS REG MASTER CLEAR TEST
8164                            ;*
8165                            ;* FIRST, ALL READ/WRITE BITS OF REGS 10-17 ARE SET BY LOADING A
8166                            ;* DIFFERENT WORD OF PATTERN G INTO EACH REG.  THEN,
8167                            ;* A MASTER CLEAR IS ISSUED AND EACH REG IS READ AND COMPARED TO A WORD OF
8168                            ;* PATTERN M, WHICH CONTAINS THE INITIALIZED STATES OF THE REGS. (UNPREDICTABLE
8169                            ;* BITS ARE MASKED OFF TO 0 BEFORE COMPARISON).
8170                            ;*   PATTERN G = 000,000,240,120,177,000,000,001
8171                            ;*   PATTERN M = 000,020,000,000,200,000,000,051
8172                            ;;*************************************************************************************
8173  022444                    BGNTST
 (3)  022444                                                        T7::
8174  022444  004737  003576           JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
8175  022450  012737  000010  002400   MOV     #10,REGNUM      ;INIT REG NO. TO 10
8176  022456  012701  002644           MOV     #PATG,R1        ;INIT DATA PATTERN POINTER
8177  022462  112137  002366    2$:    MOVB    (R1)+,WRIBYT    ;SET DATA PATTERN BYTE TO BE WRITTEN
8178  022466  004737  003722           JSR     PC,WRITLU       ;WRITE BYTE INTO REG
8179  022472  005237  002400           INC     REGNUM          ;INCREMENT REG NO. FOR WRITING
8180  022476  020127  002654           CMP     R1,#PATH        ;SEE IF ALL BYTES WRITTEN YET
8181  022502  103767                   BLO     2$              ;BR IF NOT DONE WRITING YET
8182  022504  004737  003576           JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
8183  022510  012737  000010  002400   MOV     #10,REGNUM      ;INIT LU REG NO. TO 10
8184  022516  012702  003022           MOV     #PATM,R2        ;INIT DATA PATTERN POINTER
8185  022522  012701  002550           MOV     #UPBITS,R1      ;INIT POINTER TO UNPREDICTABLE BITS
8186  022526                    3$:
8187  022526  004737  003644           JSR     PC,READLU       ;READ A LINE UNIT REG
8188  022532  142137  002364           BICB    (R1)+,REDBYT    ;MASK OUT UNPREDICTABLE BITS FOR THIS REG
8189  022536  123712  002364           CMPB    REDBYT,(R2)     ;COMPARE MASKED DATA TO EXPECTED
8190  022542  001417                   BEQ     6$              ;BR IF DATA READ IS OK
8191  022544  005037  002404           CLR     GOODAT
8192  022550  111237  002404           MOVB    (R2),GOODAT     ;SET EXPECTED DATA
8193  022554  013737  002364  002406   MOV     REDBYT,BADDAT   ;SET ACTUAL DATA
8194  022562  004737  003770           JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
8195                            ;REPORT REG NOT CLEARED BY MASTER CLEAR
8196  022566                           ERRDF   2,EM2,ERR2
 (4)  022566  104455                                                    TRAP    C$ERDF
 (5)  022570  000002                                                    .WORD   2
 (5)  022572  012135                                                    .WORD   EM2
 (5)  022574  014606                                                    .WORD   ERR2
8197  022576                           ESCAPE  TST
 (3)  022576  104410                                                    TRAP    C$ESCAPE
```

```
  (3)  022600  000016                                                          .WORD   L10030-.
8198   022602  005237  002400        6$:     INC     REGNUM          ;INCREMENT REG NO.
8199   022606  005202                        INC     R2              ;INCR DATA PATTERN POINTER
8200   022610  020227  003032                CMP     R2,#PATN        ;SEE IF ALL DONE YET
8201   022614  103744                        BLO     3$              ;BR IF NOT DONE YET
8202   022616                      ENDTST
  (3)  022616                                                                L10030:
  (3)  022616  104401                                                            TRAP    C$ETST
8203
8204
8205
8206
8207
8208                                ;;*******************************************************************************
8209                                .SBTTL      TEST 8 - REGISTER 10-17 ADDRESSING TEST
8210                                ;*
8211                                ;* FIRST, A MASTER CLEAR IS ISSUED. THEN,
8212                                ;* WRITE A DIFFERENT WORD OF DATA PATTERN B INTO EACH OF REGS 10-17,
8213                                ;* AND AFTER EACH WRITE, READ AND COMPARE ALL REGS TO EXPECTED VALUES.
8214                                ;* UNPREDICTABLE BITS ARE MASKED OFF TO 0 WHEN READ FOR COMPARISON.
8215                                ;*    PATTERN B = 000,000,040,100,220,000,000,051
8216                                ;;*******************************************************************************
8217   022620                       BGNTST
  (3)  022620                                                                T8::
8218   022620  004737  003576                JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
8219   022624  012701  002500                MOV     #REDDAT,R1      ;INIT POINTER TO EXPECTED DATA AREA
8220   022630  012702  003022                MOV     #PATM,R2        ;GET POINTER TO PATTERN M
8221   022634  012703  000010                MOV     #8.,R3          ;SET COUNTER
8222   022640  112221              3$:       MOVB    (R2)+,(R1)+     ;LOAD BYTE OF PATRN INTO EXPECTED DATA AREA
8223   022642  005303                        DEC     R3              ;DECR COUNTER
8224   022644  001375                        BNE     3$              ;BR IF NOT DONE LOADING YET
8225   022646  005001                        CLR     R1              ;INIT DATA PATTERN INDEX FOR WRITING
8226   022650  010137  002400        6$:     MOV     R1,REGNUM
8227   022654  062737  000010  002400        ADD     #10,REGNUM      ;GET REG NO. FOR WRITING
8228   022662  116137  002615  002366        MOVB    PATB(R1),WRIBYT ;SET DATA BYTE TO BE WRITTEN
8229   022670  113761  002366  002500        MOVB    WRIBYT,REDDAT(R1) ;SET EXPECTED DATA FOR READ
8230   022676  146161  002550  002500        BICB    UPBITS(R1),REDDAT(R1) ;MASK OUT UNPREDICTABLE BITS
8231   022704  004737  003722                JSR     PC,WRITLU       ;WRITE DATA BYTE INTO REG
8232   022710  005003                        CLR     R3              ;INIT DATA PAT INDEX FOR READS
8233   022712  010337  002400        9$:     MOV     R3,REGNUM
8234   022716  062737  000010  002400        ADD     #10,REGNUM      ;GET REG NO. FOR READING
8235   022724  004737  003644                JSR     PC,READLU       ;READ A LINE UNIT REG
8236   022730  146337  002550  002364        BICB    UPBITS(R3),REDBYT ;MASK OUT UNPREDICTABLE BITS
8237   022736  023727  002400  000011        CMP     REGNUM,#11      ;SEE IF READING REG 11
8238   022744  001006                        BNE     10$             ;BR IF NOT
8239   022746  142737  000020  002364        BICB    #ORDY,REDBYT    ;MASK ORDY BIT IN ACTUAL BYTE
8240   022754  142763  000020  002500        BICB    #ORDY,REDDAT(R3) ;MASK ORDY BIT IN EXPECTED BYTE
8241   022762  123763  002364  002500  10$:  CMPB    REDBYT,REDDAT(R3) ;COMPARE BYTE READ TO EXPECTED
8242   022770  001420                        BEQ     12$             ;BR IF DATA MATCHES
8243   022772  005037  002404                CLR     GOODAT
8244   022776  116337  002500  002404        MOVB    REDDAT(R3),GOODAT ;SET EXPECTED DATA
8245   023004  013737  002364  002406        MOV     REDBYT,BADDAT   ;SET ACTUAL DATA
8246   023012  004737  003770                JSR     PC,GETREG       ;READ AND STORE REGS 10-17 FOR PRINTOUT
8247                               ;REPORT REG MISCOMPARE
8248   023016                              ERRDF   3,EM3,ERR2
  (4)  023016  104455                                                            TRAP    C$ERDF
```

```
  (5)  023020  000003                                                    .WORD   3
  (5)  023022  012174                                                    .WORD   EM3
  (5)  023024  014606                                                    .WORD   ERR2
 8249  023026                      ESCAPE  TST
  (3)  023026  104410                                                    TRAP    C$ESCAPE
  (3)  023030  000022                                                    .WORD   L10031-.
 8250  023032  005203              12$:    INC     R3              ;INCREMENT DATA PATTERN INDEX FOR READING
 8251  023034  020327  000010              CMP     R3,#10          ;SEE IF ALL REGS READ YET
 8252  023040  002724                      BLT     9$              ;BR IF NOT
 8253  023042  005201                      INC     R1              ;INCREMENT DATA PAT INDEX FOR WRITING
 8254  023044  020127  000010              CMP     R1,#10          ;SEE IF ALL REGS WRITTEN YET
 8255  023050  002677                      BLT     6$              ;BR IF NOT
 8256  023052                      ENDTST
  (3)  023052                                                                    L10031:
  (3)  023052  104401                                                                    TRAP    C$ETST
 8257
 8258
 8259
 8260
 8261
 8262                             ;;*******************************************************************************
 8263                             .SBTTL      TEST 9 - REG 11 READ/WRITE BIT TEST
 8264                             ;*
 8265                             ;* WRITE, READ, AND COMPARE EACH WORD OF DATA PATTERN C INTO REG 11 :
 8266                             ;*      DATA PATTERN C = 020,020,020.
 8267                             ;;*******************************************************************************
 8268  023054                     BGNTST
  (3)  023054                                                                    T9::
 8269  023054  004737  003576              JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
 8270  023060  012737  000011  002400      MOV     #11,REGNUM      ;SET LU REG NO. = 11
 8271  023066  012701  002625              MOV     #PATC,R1        ;GET POINTER TO DATA PAT IN R1
 8272  023072                     3$:
 8273  023072                             BGNSEG
  (3)  023072  104404                                                                    TRAP    C$BSEG
 8274  023074  111137  002366              MOVB    (R1),WRIBYT     ;GET A BYTE OF PAT C
 8275  023100  004737  003722              JSR     PC,WRITLU       ;WRITE DATA BYTE INTO REG 11
 8276  023104  004737  003644              JSR     PC,READLU       ;READ DATA BYTE FROM REG 11
 8277  023110  143737  002551  002364      BICB    UPBITS+1,REDBYT ;MASK OUT UNPREDICTABLE BITS
 8278  023116  123737  002364  002366      CMPB    REDBYT,WRIBYT   ;COMPARE BYTE READ TO BYTE WRITTEN
 8279  023124  001414                      BEQ     6$              ;BR IF BYTES MATCH
 8280  023126  013737  002366  002404      MOV     WRIBYT,GOODAT   ;SET EXPECTED REG CONTENTS
 8281  023134  013737  002364  002406      MOV     REDBYT,BADDAT   ;SET ACTUAL REG CONTENTS
 8282  023142  004737  003770              JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
 8283                             ;REPORT LINE UNIT REG MISCOMPARE
 8284  023146                             ERRDF   3,EM3,ERR2
  (4)  023146  104455                                                    TRAP    C$ERDF
  (5)  023150  000003                                                    .WORD   3
  (5)  023152  012174                                                    .WORD   EM3
  (5)  023154  014606                                                    .WORD   ERR2
 8285  023156                     6$:
 8286  023156                             ENDSEG
  (3)  023156                                                                    10000$:
  (3)  023156  104405                                                                    TRAP    C$ESEG
 8287  023160  005201              INC     R1              ;INCREMENT DATA PATTERN POINTER
 8288  023162  020127  002630      CMP     R1,#PATD        ;SEE IF ALL WORDS OF PATTERN C USED YET
 8289  023166  103741              BLO     3$              ;BR IF NOT DONE YET
```

```
 8290  023170                          ENDTST
  (3)  023170                                                                  L10032:
  (3)  023170  104401                                                                  TRAP    C$ETST
 8291
 8292
 8293
 8294
 8295
 8296                                  ;;*************************************************************************************
 8297                                  .SBTTL      TEST 10 - REG 12 READ/WRITE BIT TEST
 8298                                  ;*
 8299                                  ;* WRITE, READ, AND COMPARE EACH WORD OF DATA PATTERN D INTO REG 12 :
 8300                                  ;*      DATA PATTERN D = 000,040,000.
 8301                                  ;;*************************************************************************************
 8302  023172                          BGNTST
  (3)  023172                                                                  T10::
 8303  023172  004737  003576                 JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
 8304  023176  012737  C00012  002400         MOV     #12,REGNUM      ;SET LU REG NO. = 12
 8305  023204  012701  002630                 MOV     #PATD,R1        ;GET POINTER TO DATA PAT IN R1
 8306  023210                          3$:
 8307  023210                                  BGNSEG
  (3)  023210  104404                                                                  TRAP    C$BSEG
 8308  023212  111137  002366                 MOVB    (R1),WRIBYT     ;GET A BYTE OF PAT D
 8309  023216  004737  003722                 JSR     PC,WRITLU       ;WRITE DATA BYTE INTO REG 12
 8310  023222  004737  003644                 JSR     PC,READLU       ;READ DATA BYTE FROM REG 12
 8311  023226  143737  002552  002364         BICB    UPBITS+2,REDBYT ;MASK OUT UNPREDICTABLE BITS
 8312  023234  123737  002364  002366         CMPB    REDBYT,WRIBYT   ;COMPARE BYTE READ TO BYTE WRITTEN
 8313  023242  001414                         BEQ     6$              ;BR IF BYTES MATCH
 8314  023244  013737  002366  002404         MOV     WRIBYT,GOODAT   ;SET EXPECTED REG CONTENTS
 8315  023252  013737  002364  002406         MOV     REDBYT,BADDAT   ;SET ACTUAL REG CONTENTS
 8316  023260  004737  003770                 JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
 8317                                  ;REPORT LINE UNIT REG MISCOMPARE
 8318  023264                                  ERRDF   3,EM3,ERR2
  (4)  023264  104455                                                                  TRAP    C$ERDF
  (5)  023266  000003                                                                  .WORD   3
  (5)  023270  012174                                                                  .WORD   EM3
  (5)  023272  014606                                                                  .WORD   ERR2
 8319  023274                          6$:
 8320  023274                                  ENDSEG
  (3)  023274                                                                  10000$:
  (3)  023274  104405                                                                  TRAP    C$ESEG
 8321  023276  005201                         INC     R1              ;INCREMENT DATA PATTERN POINTER
 8322  023300  020127  002633                 CMP     R1,#PATE        ;SEE IF ALL WORDS OF PATTERN D USED YET
 8323  023304  103741                         BLO     3$              ;BR IF NOT DONE YET
 8324  023306                          ENDTST
  (3)  023306                                                                  L10033:
  (3)  023306  104401                                                                  TRAP    C$ETST
 8325
 8326
 8327
 8328
 8329
 8330                                  ;;*************************************************************************************
 8331                                  .SBTTL      TEST 11 - REG 13 READ/WRITE BIT TEST
 8332                                  ;*
 8333                                  ;* WRITE, READ, AND COMPARE EACH WORD OF DATA PATTERN E INTO REG 13 :
```

```
                                ;*     DATA PATTERN E = 000,120,020,100,120,000.
                                ;;*****************************************************************************
                                BGNTST
                                                                                T11::
                                        JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
                                        MOV     #13,REGNUM      ;SET LU REG NO. = 13
                                        MOV     #PATE,R1        ;GET POINTER TO DATA PAT IN R1
                                3$:
                                        BGNSEG
                                                                                        TRAP    C$BSEG
                                        MOVB    (R1),WRIBYT     ;GET A BYTE OF PAT E
                                        JSR     PC,WRITLU       ;WRITE DATA BYTE INTO REG 13
                                        JSR     PC,READLU       ;READ DATA BYTE FROM REG 13
                                        BICB    UPBITS+3,REDBYT ;MASK OUT UNPREDICTABLE BITS
                                        CMPB    REDBYT,WRIBYT   ;COMPARE BYTE READ TO BYTE WRITTEN
                                        BEQ     6$              ;BR IF BYTES MATCH
                                        MOV     WRIBYT,GOODAT   ;SET EXPECTED REG CONTENTS
                                        MOV     REDBYT,BADDAT   ;SET ACTUAL REG CONTENTS
                                        JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
                                ;REPORT LINE UNIT REG MISCOMPARE
                                        ERRDF   3,EM3,ERR2
                                                                                        TRAP    C$ERDF
                                                                                        .WORD   3
                                                                                        .WORD   EM3
                                                                                        .WORD   ERR2
                                6$:
                                        ENDSEG
                                                                                10000$:
                                                                                        TRAP    C$ESEG
                                        INC     R1              ;INCREMENT DATA PATTERN POINTER
                                        CMP     R1,#PATF        ;SEE IF ALL WORDS OF PATTERN E USED YET
                                        BLO     3$              ;BR IF NOT DONE YET
                                ENDTST
                                                                                L10034:
                                                                                        TRAP    C$ETST


                                ;;*****************************************************************************
                                .SBTTL      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.
                                ;;*****************************************************************************
                                BGNTST
                                                                                T12::
                                        JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
                                        MOV     #17,REGNUM      ;SET LU REG NO. = 17
                                        MOV     #PATF,R1        ;GET POINTER TO DATA PAT IN R1
                                3$:
                                        BGNSEG
                                                                                        TRAP    C$BSEG
                                        MOVB    (R1),WRIBYT     ;GET A BYTE OF PAT F
                                        JSR     PC,WRITLU       ;WRITE DATA BYTE INTO REG 17
```

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 8378  023456  004737  003644                JSR     PC,READLU       ;READ DATA BYTE FROM REG 17
 8379  023462  143737  002557  002364        BICB    UPBITS+7,REDBYT ;MASK OUT UNPREDICTABLE BITS
 8380  023470  123737  002364  002366        CMPB    REDBYT,WRIBYT   ;COMPARE BYTE READ TO BYTE WRITTEN
 8381  023476  001414                        BEQ     6$              ;BR IF BYTES MATCH
 8382  023500  013737  002366  002404        MOV     WRIBYT,GOODAT   ;SET EXPECTED REG CONTENTS
 8383  023506  013737  002364  002406        MOV     REDBYT,BADDAT   ;SET ACTUAL REG CONTENTS
 8384  023514  004737  003770                JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
 8385                                ;REPORT LINE UNIT REG MISCOMPARE
 8386  023520                                ERRDF   3,EM3,ERR2
   (4) 023520  104455                                                      TRAP    C$ERDF
   (5) 023522  000003                                                      .WORD   3
   (5) 023524  012174                                                      .WORD   EM3
   (5) 023526  014606                                                      .WORD   ERR2
 8387  023530                          6$:
 8388  023530                                ENDSEG
   (3) 023530                                                          10000$:
   (3) 023530  104405                                                      TRAP    C$ESEG
 8389  023532  005201                        INC     R1              ;INCREMENT DATA PATTERN POINTER
 8390  023534  020127  002644                CMP     R1,#PATG        ;SEE IF ALL WORDS OF PATTERN F USED YET
 8391  023540  103741                        BLO     3$              ;BR IF NOT DONE YET
 8392  023542                          ENDTST
   (3) 023542                                                          L10035:
   (3) 023542  104401                                                      TRAP    C$ETST
 8393
 8394
 8395
 8396
 8397
 8398                                ;;**************************************************************************************
 8399                                .SBTTL      TEST 13 - MAINTENANCE CLOCK BIT TEST
 8400                                ;*
 8401                                ;* FIRST, A MASTER CLEAR IS ISSUED TO INIT ALL REGS. THEN, THE MICROPROCESSOR
 8402                                ;* IS PLACED IN A LOOP ON AN INSTRUCTION, BY SETTING THE INSTRUCTION IN SEL6
 8403                                ;* AND SETTING ROMI AND RUN IN BSEL1. THE INSTRUCTION IS ONE WHICH REPETITIVELY
 8404                                ;* READS LINE UNIT REG 17 INTO BSEL2. THE PDP-11 CAN THEN SCAN BSEL2 TO MONITOR
 8405                                ;* THE MAINTENANCE CLOCK BIT, MCLK. THE FOLLOWING SEQUENCE IS THEN PERFORMED
 8406                                ;* TO MONITOR MCLK :
 8407                                ;* - THE PROGRAM REPEATEDLY CHECKS THE MCLK BIT FOR THE 1 STATE, AND IF IT IS
 8408                                ;*   NOT FOUND WITHIN SEVERAL HUNDRED MILLI-SEC (DEPENDING ON THE PROCESSOR)
 8409                                ;*   AN ERROR IS REPORTED. (THE MAINTENANCE CLOCK HAS A PERIOD OF 41.6 MICRO-
 8410                                ;*   SEC).
 8411                                ;* - THE PROGRAM NEXT REPEATEDLY CHECKS THE MCLK BIT FOR THE 0 STATE, AND IF
 8412                                ;*   IT IS NOT FOUND WITHIN SEVERAL HUNDRED MILLI-SEC AN ERROR IS REPORTED.
 8413                                ;* - THE PROGRAM NEXT REPEATEDLY CHECKS MCLK BIT FOR THE 1 STATE AGAIN, AND
 8414                                ;*   IF IT IS NOT FOUND WITHIN SEVERAL HUNDRED MILLI-SEC, AN ERROR IS REPORTED.
 8415                                ;*
 8416                                ;* IF THE P-TABLE FOR THIS UNIT INDICATES THAT THE MICROPROCESSOR RUN SWITCH
 8417                                ;* IS NOT ON, THE TEST WILL BE SKIPPED.
 8418                                ;;**************************************************************************************
 8419  023544                          BGNTST
   (3) 023544                                                          T13::
 8420  023544  004737  003576                JSR     PC,MSTCLR       ;PERFORM MASTER CLEAR
 8421  023550  012737  000015  002442        MOV     #13.,TSTNUM     ;SET TEST NO.
 8422  023556  005737  002476                TST     RUNINH          ;SEE IF RUN SWITCH IS SET
 8423  023562  001020                        BNE     1$              ;BR IF YES, TO RUN TEST
 8424  023564  023727  002444  000001        CMP     STARES,#1       ;SEE IF THIS IS FIRST PASS SINCE STA OR RES
```

```
8425  023572  001012                        BNE     40$             ;BR IF NOT, TO SKIP PRINTING
8426  023574                                PRINTF  #FMT19,TSTNUM   ;PRINT MSG TO SAY TEST NOT RUN
 (8)  023574  013746  002442                                                MOV     TSTNUM,-(SP)
 (7)  023600  012746  011761                                                MOV     #FMT19,-(SP)
 (6)  023604  012746  000002                                                MOV     #2,-(SP)
 (3)  023610  010600                                                        MOV     SP,R0
 (4)  023612  104417                                                        TRAP    C$PNTF
 (4)  023614  062706  000006                                                ADD     #6,SP
8427  023620  000137  024166          40$:  JMP     A1              ;GO TO SKIP TEST
8428  023624  012737  000017  002400  1$:   MOV     #17,REGNUM      ;SET REG NO. = 17
8429  023632  012701  000360                MOV     #360,R1         ;SET INSTRUCTION SOURCE = INBUS REG 17
8430  023636  052701  000002                BIS     #2,R1           ;SET INSTRUCTION DESTINATION = BSEL2
8431  023642  052701  021000                BIS     #MVIOX,R1       ;SET REST OF MOVE INSTRUCTION
8432  023646  010137  023656                MOV     R1,2$           ;SET INSTRUCTION AS SUBROUTINE ARGUMENT
8433  023652  004737  004046                JSR     PC,LOOPIN       ;GET MICROPROCESSOR LOOPING ON MOVE INSTRUCTION
8434  023656  000000          2$:   .WORD   0               ;INSTRUCTION GOES HERE
8435
8436                                ;-------------------------------------------------------------------------------
8437                                ; WAIT FOR MCLK BIT TO BE SET TO 1
8438                                ;-------------------------------------------------------------------------------
8439  023660  005037  002510                CLR     REG0            ;INIT PROGRAM TIMER
8440  023664  117737  156562  002364  3$:   MOVB    @BSEL2,REDBYT   ;GET REG 17 INTO REDBYT
8441  023672  132737  000002  002364        BITB    #MCLK,REDBYT    ;SEE IF MCLK BIT = 1 YET
8442  023700  001031                        BNE     6$              ;BR IF MCLK = 1
8443  023702  005237  002510                INC     REG0            ;INCREMENT TIMER
8444  023706  001366                        BNE     3$              ;BR IF PROGRAM TIMER DID NOT TIME OUT YET
8445                                                                ; (TIME OUT = SEVERAL HUNDRED MILLI-SEC)
8446  023710  012737  000002  002404        MOV     #MCLK,GOODAT    ;SET EXPECTED REG CONTENTS
8447  023716  013737  002364  002406        MOV     REDBYT,BADDAT   ;SET ACTUAL REG CONTENTS
8448  023724  004737  003770                JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
8449                                ;REPORT MCLK BIT STUCK AT 0
8450  023730                                ERRDF   5,EM5,ERR2
 (4)  023730  104455                                                        TRAP    C$ERDF
 (5)  023732  000005                                                        .WORD   5
 (5)  023734  012266                                                        .WORD   EM5
 (5)  023736  014606                                                        .WORD   ERR2
8451                                ;TYPE 'PLEASE INSURE MICROPROCESSOR RUN SWITCH IS ON'
8452  023740                                PRINTF  #FMT24
 (7)  023740  012746  012012                                                MOV     #FMT24,-(SP)
 (6)  023744  012746  000001                                                MOV     #1,-(SP)
 (3)  023750  010600                                                        MOV     SP,R0
 (4)  023752  104417                                                        TRAP    C$PNTF
 (4)  023754  062706  000004                                                ADD     #4,SP
8453  023760  000137  024166                JMP     A1              ;ESCAPE TO END OF TEST
8454
8455                                ;-------------------------------------------------------------------------------
8456                                ; WAIT FOR MCLK BIT TO BE CLEARED TO 0
8457                                ;-------------------------------------------------------------------------------
8458  023764                        6$:
8459  023764  005037  002510                CLR     REG0            ;INIT PROGRAM TIMER
8460  023770  117737  156456  002364  8$:   MOVB    @BSEL2,REDBYT   ;GET REG 17 INTO REDBYT
8461  023776  132737  000002  002364        BITB    #MCLK,REDBYT    ;SEE IF MCLK BIT = 0 YET
8462  024004  001430                        BEQ     10$             ;BR IF MCLK = 0
8463  024006  005237  002510                INC     REG0            ;INCREMENT TIMER
8464  024012  001366                        BNE     8$              ;BR IF TIMER DID NOT TIME OUT YET
8465  024014  005037  002404                CLR     GOODAT          ;SET EXPECTED REG CONTENTS
```

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8466  024020  013737  002364  002406          MOV     REDBYT,BADDAT   ;SET ACTUAL REG CONTENTS
8467  024026  004737  003770                  JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
8468                                  ;REPORT MCLK BIT STUCK AT 1
8469  024032                                  ERRDF   6,EM6,ERR2
  (4) 024032  104455                                                          TRAP    C$ERDF
  (5) 024034  000006                                                          .WORD   6
  (5) 024036  012317                                                          .WORD   EM6
  (5) 024040  014606                                                          .WORD   ERR2
8470                                  ;TYPE 'PLEASE INSURE MICROPROCESSOR RUN SWITCH IS ON'
8471  024042                                  PRINTF  #FMT24
  (7) 024042  012746  012012                                                  MOV     #FMT24,-(SP)
  (6) 024046  012746  000001                                                  MOV     #1,-(SP)
  (3) 024052  010600                                                          MOV     SP,R0
  (4) 024054  104417                                                          TRAP    C$PNTF
  (4) 024056  062706  000004                                                  ADD     #4,SP
8472  024062  000137  024166                  JMP     A1              ;ESCAPE TO END OF TEST
8473
8474                                  ;-------------------------------------------------------------------------------
8475                                  ; WAIT FOR MCLK BIT TO BE SET TO 1 AGAIN
8476                                  ;-------------------------------------------------------------------------------
8477  024066                          10$:
8478  024066  005037  002510                  CLR     REG0            ;INIT PROGRAM TIMER
8479  024072  117737  156354  002364  12$:    MOVB    @BSEL2,REDBYT   ;GET REG 17 INTO REDBYT
8480  024100  132737  000002  002364          BITB    #MCLK,REDBYT    ;SEE IF MCLK BIT = 1 YET
8481  024106  001027                          BNE     A1              ;BE IF MCLK = 1
8482  024110  005237  002510                  INC     REG0            ;INCREMENT TIMER
8483  024114  001366                          BNE     12$             ;BR IF TIMER DID NOT TIME OUT YET
8484  024116  012737  000002  002404          MOV     #MCLK,GOODAT    ;SET EXPECTED REG CONTENTS
8485  024124  013737  002364  002406          MOV     REDBYT,BADDAT   ;SET ACTUAL REG CONTENTS
8486  024132  004737  003770                  JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
8487                                  ;REPORT MCLK BIT STUCK AT 0
8488  024136                                  ERRDF   5,EM5,ERR2
  (4) 024136  104455                                                          TRAP    C$ERDF
  (5) 024140  000005                                                          .WORD   5
  (5) 024142  012266                                                          .WORD   EM5
  (5) 024144  014606                                                          .WORD   ERR2
8489                                  ;TYPE 'PLEASE INSURE MICROPROCESSOR RUN SWITCH IS ON'
8490  024146                                  PRINTF  #FMT24
  (7) 024146  012746  012012                                                  MOV     #FMT24,-(SP)
  (6) 024152  012746  000001                                                  MOV     #1,-(SP)
  (3) 024156  010600                                                          MOV     SP,R0
  (4) 024160  104417                                                          TRAP    C$PNTF
  (4) 024162  062706  000004                                                  ADD     #4,SP
8491  024166                          A1:
8492  024166  004737  003576                  JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
8493  024172                          ENDTST
  (3) 024172                                                          L10036:
  (3) 024172  104401                                                          TRAP    C$ETST
8494
8495
8496
8497
8498
8499                                  ;;*************************************************************************************
8500                                  .SBTTL      TEST 14 - EXTENDED REGISTER MASTER CLEAR TEST
8501                                  ;*
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```
                                ;* FIRST, ALL READ/WRITE BITS OF EXTENDED REGS AX0-AX3 ARE SET BY LOADING
                                ;* A DIFFERENT WORD OF PATTERN H INTO EACH REG. THEN, A MASTER CLEAR IS
                                ;* ISSUED AND EACH REG IS READ AND COMPARED TO A WORD OF PATTERN I, WHICH
                                ;* CONTAINS THE INITIALIZED STATES OF ALL THE EXTENDED REGS.
                                ;*    PATTERN H = 000,000,377,017,377,377,375,377
                                ;*    PATTERN I = 000,000,000,000,000,103,000,000
                                ;;*****************************************************************************
 8509  024174                   BGNTST
  (3)  024174                                                                          T14::
 8510  024174  004737  003576          JSR     PC,MSTCLR       ;ISSUE AN INITIAL MASTER CLEAR
 8511  024200  005037  002402          CLR     AXNUM           ;INIT AX REG BYTE NO. TO 0
 8512  024204  012701  002654          MOV     #PATH,R1        ;INIT DATA PATTERN POINTER
 8513  024210  112137  002374  1$:     MOVB    (R1)+,WAX15     ;SET BITS TO LOAD INTO LO BYTE
 8514  024214  112137  002376          MOVB    (R1)+,WAX16     ;SET BITS TO LOAD INTO HI BYTE
 8515  024220  004737  004264          JSR     PC,WRITAX       ;WRITE EXTENDED REG
 8516  024224  032737  000002  002420  BIT     #WRDYTO,ERROR1  ;SEE IF READY FAILED TO SET
 8517  024232  001413                  BEQ     8$              ;BR IF NOT
 8518  024234  012737  000014  002400  MOV     #14,REGNUM      ;SET LU REG NO = 14
 8519  024242  004737  003770          JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
 8520                           ;REPORT READY NOT SET AFTER AX REG WRITE
 8521  024246                          ERRDF   52,EM52,ERR9
  (4)  024246  104455                                                                  TRAP    C$ERDF
  (5)  024250  000064                                                                  .WORD   52
  (5)  024252  014061                                                                  .WORD   EM52
  (5)  024254  020604                                                                  .WORD   ERR9
 8522  024256                          ESCAPE  TST
  (3)  024256  104410                                                                  TRAP    C$ESCAPE
  (3)  024260  000244                                                                  .WORD   L10037-.
 8523  024262  062737  000002  002402  8$:     ADD     #2,AXNUM        ;INCR REG BYTE NO.
 8524  024270  020127  002664          CMP     R1,#PATI        ;SEE IF ALL REGS WRITTEN YET
 8525  024274  103745                  BLO     1$              ;BR IF NOT DONE WRITING YET
 8526  024276  004737  003576          JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
 8527  024302  005037  002402          CLR     AXNUM           ;INIT EXTENDED REG BYTE NO. TO 0
 8528  024306  012701  002664          MOV     #PATI,R1        ;INIT DATA PAT POINTER FOR READS
 8529  024312  004737  004076  2$:     JSR     PC,READAX       ;READ AN EXTENDED REG
 8530  024316  032737  000001  002420  BIT     #RRDYTO,ERROR1  ;SEE IF READY FAILED TO SET
 8531  024324  001413                  BEQ     10$             ;BR IF NOT
 8532  024326  012737  000014  002400  MOV     #14,REGNUM      ;SET LU REG NO. = 14
 8533  024334  004737  003770          JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
 8534                           ;REPORT READY NOT SET AFTER AX REG READ
 8535  024340                          ERRDF   53,EM53,ERR9
  (4)  024340  104455                                                                  TRAP    C$ERDF
  (5)  024342  000065                                                                  .WORD   53
  (5)  024344  014122                                                                  .WORD   EM53
  (5)  024346  020604                                                                  .WORD   ERR9
 8536  024350                          ESCAPE  TST
  (3)  024350  104410                                                                  TRAP    C$ESCAPE
  (3)  024352  000152                                                                  .WORD   L10037-.
 8537  024354  023727  002402  000006  10$:    CMP     AXNUM,#6        ;SEE IF AX3-15
 8538  024362  001003                  BNE     3$              ;BR IF NOT
 8539  024364  142737  000332  002370          BICB    #AX315U,RAX15   ;MASK OFF UNPREDICTABLE BITS
 8540  024372  123711  002370          3$:     CMPB    RAX15,(R1)      ;COMPARE LO BYTE TO EXPECTED VALUE
 8541  024376  001417                  BEQ     4$              ;BR IF DATA MATCHES
 8542  024400  005037  002404          CLR     GOODAT
 8543  024404  111137  002404          MOVB    (R1),GOODAT     ;GET EXPECTED DATA BYTE
 8544  024410  013737  002370  002406  MOV     RAX15,BADDAT    ;GET ACTUAL DATA BYTE
```

```
 8545  024416  004737  004500                 JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
 8546                                ;REPORT REG NOT INITIALIZED BY MASTER CLEAR
 8547  024422                                ERRDF   2,EM2,ERR3
   (4) 024422  104455                                                          TRAP    C$ERDF
   (5) 024424  000002                                                          .WORD   2
   (5) 024426  012135                                                          .WORD   EM2
   (5) 024430  015114                                                          .WORD   ERR3
 8548  024432                                ESCAPE  TST
   (3) 024432  104410                                                          TRAP    C$ESCAPE
   (3) 024434  000070                                                          .WORD   L10037-.
 8549  024436  005237  002402          4$:   INC     AXNUM           ;INCREMENT AX BYTE NO.
 8550  024442  005201                        INC     R1              ;INCREMENT PAT POINTER
 8551  024444  123711  002372                CMPB    RAX16,(R1)      ;COMPARE HI BYTE TO EXPECTED VALUE
 8552  024450  001417                        BEQ     6$              ;BR IF DATA MATCHES
 8553  024452  005037  002404                CLR     GOODAT
 8554  024456  111137  002404                MOVB    (R1),GOODAT     ;GET EXPECTED DATA BYTE
 8555  024462  013737  002372  002406        MOV     RAX16,BADDAT    ;GET ACTUAL DATA BYTE
 8556  024470  004737  004500                JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
 8557                                ;REPORT REG NOT INITIALIZED BY MASTER CLEAR
 8558  024474                                ERRDF   2,EM2,ERR3
   (4) 024474  104455                                                          TRAP    C$ERDF
   (5) 024476  000002                                                          .WORD   2
   (5) 024500  012135                                                          .WORD   EM2
   (5) 024502  015114                                                          .WORD   ERR3
 8559  024504                                ESCAPE  TST
   (3) 024504  104410                                                          TRAP    C$ESCAPE
   (3) 024506  000016                                                          .WORD   L10037-.
 8560  024510  005237  002402          6$:   INC     AXNUM           ;INCR AX BYTE NO.
 8561  024514  005201                        INC     R1              ;INCR PAT POINTER
 8562  024516  020127  002674                CMP     R1,#PATJ        ;SEE IF ALL REGS READ YET
 8563  024522  103673                        BLO     2$              ;BR IF NOT DONE READING YET
 8564  024524                          ENDTST
   (3) 024524                                                                L10037:
   (3) 024524  104401                                                                TRAP    C$ETST
 8565
 8566
 8567
 8568
 8569
 8570                                ;;*****************************************************************************
 8571                                .SBTTL      TEST 15 - EXTENDED REGISTER ADDRESSING TEST
 8572                                ;*
 8573                                ;* FIRST, ISSUE A MASTER CLEAR TO PUT REGS INTO INITIALIZED STATES SHOWN IN
 8574                                ;* PATTERN I. THEN, WRITE A DIFFERENT WORD OF PATTERN J INTO EACH EXTENDED (AX)
 8575                                ;* REG, AND AFTER EACH WRITE, READ AND COMPARE ALL EXTENDED REGS TO EXPECTED
 8576                                ;* VALUES.
 8577                                ;*   PATTERN I = 000,000,000,000,000,103,000,000
 8578                                ;*   PATTERN J = 000,000,010,002,004,103,001,100
 8579                                ;;*****************************************************************************
 8580  024526                          BGNTST
   (3) 024526                                                                T15::
 8581  024526  004737  003576                JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
 8582  024532  012701  002664                MOV     #PATI,R1        ;INIT POINTER TO PAT I
 8583  024536  012702  002500                MOV     #REDDAT,R2      ;INIT POINTER TO EXPECTED DATA AREA
 8584  024542  112122                  3$:   MOVB    (R1)+,(R2)+     ;MOVE PAT I INTO REDDAT TABLE
 8585  024544  020127  002674                CMP     R1,#PATJ
```

```
 8586  024550  103774                          BLO     3$
 8587  024552  005001                          CLR     R1                  ;INIT INDEX FOR WRITING
 8588  024554  010137  002402                6$:     MOV     R1,AXNUM            ;GET AX BYTE NO. FOR WRITING
 8589  024560  116137  002674  002374              MOVB    PATJ(R1),WAX15      ;SET LO AX BYTE TO BE WRITTEN
 8590  024566  116137  002675  002376              MOVB    PATJ+1(R1),WAX16    ;SET HI AX BYTE TO BE WRITTEN
 8591  024574  113761  002374  002500              MOVB    WAX15,REDDAT(R1)    ;SET EXPECTED LO BYTE IN TABLE
 8592  024602  113761  002376  002501              MOVB    WAX16,REDDAT+1(R1)  ;SET EXPECTED HI BYTE IN TABLE
 8593  024610  004737  004264                      JSR     PC,WRITAX           ;WRITE DATA BYTES INTO EXTENDED REG
 8594  024614  005003                          CLR     R3                  ;INIT INDEX FOR READING
 8595  024616  010337  002402                9$:     MOV     R3,AXNUM            ;GET AX BYTE NO. FOR READING
 8596  024622  004737  004076                      JSR     PC,READAX           ;READ 2 AX BYTES
 8597  024626  023727  002402  000006              CMP     AXNUM,#6            ;SEE IF AX3-15
 8598  024634  001003                          BNE     10$                 ;BR IF NOT
 8599  024636  142737  000332  002370              BICB    #AX315U,RAX15       ;MASK OFF UNPREDICTABLE BITS
 8600  024644  123763  002370  002500  10$:     CMPB    RAX15,REDDAT(R3)    ;COMPARE LO BYTE READ TO EXPECTED
 8601  024652  001420                          BEQ     12$                 ;BR IF LO BYTE MATCHES EXPECTED
 8602  024654  005037  002404                      CLR     GOODAT
 8603  024660  116337  002500  002404              MOVB    REDDAT(R3),GOODAT   ;GET EXPECTED LO BYTE
 8604  024666  013737  002370  002406              MOV     RAX15,BADDAT        ;GET ACTUAL DATA
 8605  024674  004737  004500                      JSR     PC,GETALL           ;GET REGS FOR PRINTOUT
 8606                                  ;REPORT REG MISCOMPARE
 8607  024700                                      ERRDF   3,EM3,ERR3
   (4) 024700  104455                                                                  TRAP    C$ERDF
   (5) 024702  000003                                                                  .WORD   3
   (5) 024704  012174                                                                  .WORD   EM3
   (5) 024706  015114                                                                  .WORD   ERR3
 8608  024710                                      ESCAPE  TST
   (3) 024710  104410                                                                  TRAP    C$ESCAPE
   (3) 024712  000102                                                                  .WORD   L10040-.
 8609  024714  005237  002402                12$:     INC     AXNUM               ;INCR AX BYTE NO.
 8610  024720  123763  002372  002501              CMPB    RAX16,REDDAT+1(R3)  ;COMPARE HI BYTE READ TO EXPECTED
 8611  024726  001420                          BEQ     15$                 ;BR IF HI BYTE MATCHES EXPECTED
 8612  024730  005037  002404                      CLR     GOODAT
 8613  024734  116337  002501  002404              MOVB    REDDAT+1(R3),GOODAT ;GET EXPECTED HI BYTE
 8614  024742  013737  002372  002406              MOV     RAX16,BADDAT        ;GET ACTUAL DATA
 8615  024750  004737  004500                      JSR     PC,GETALL           ;GET REGS FOR PRINTOUT
 8616                                  ;REPORT REG MISCOMPARE
 8617  024754                                      ERRDF   3,EM3,ERR3
   (4) 024754  104455                                                                  TRAP    C$ERDF
   (5) 024756  000003                                                                  .WORD   3
   (5) 024760  012174                                                                  .WORD   EM3
   (5) 024762  015114                                                                  .WORD   ERR3
 8618  024764                                      ESCAPE  TST
   (3) 024764  104410                                                                  TRAP    C$ESCAPE
   (3) 024766  000026                                                                  .WORD   L10040-.
 8619  024770  062703  000002                15$:     ADD     #2,R3               ;INCR INDEX FOR READS
 8620  024774  020327  000010                      CMP     R3,#10              ;SEE IF ALL AX BYTES READ YET
 8621  025000  002706                          BLT     9$                  ;BR IF NOT DONE READING YET
 8622  025002  062701  000002                      ADD     #2,R1               ;INCR INDEX FOR WRITES
 8623  025006  020127  000010                      CMP     R1,#10              ;SEE IF ALL AX BYTES WRITTEN YET
 8624  025012  002660                          BLT     6$                  ;BR IF NOT DONE WRITING YET
 8625  025014                                  ENDTST
   (3) 025014                                                                                L10040:
   (3) 025014  104401                                                                  TRAP    C$ETST
 8626
 8627
```

```
                        ;;*************************************************************************
                        .SBTTL      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.
                        ;;*************************************************************************
025016                  BGNTST
025016                                                                          T16::
025016  004737  003576          JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
025022  012701  002704          MOV     #PATK,R1        ;INIT DATA PATTERN POINTER
025026                  3$:
025026                          BGNSEG
025026  104404                                                                  TRAP    C$BSEG
025030  012737  000004  002402  MOV     #4,AXNUM        ;SET BYTE NO. = 4
025036  111137  002374          MOVB    (R1),WAX15      ;SET DATA TO WRITE INTO LO BYTE
025042  116137  000001  002376  MOVB    1(R1),WAX16     ;SET DATA TO WRITE INTO HI BYTE
025050  143737  002565  002374  BICB    ANBITS+4,WAX15  ;MASK OFF NON-READ/WRITE BITS IN LO BYTE
025056  143737  002566  002376  BICB    ANBITS+5,WAX16  ;MASK OFF NON-READ/WRITE BITS IN HI BYTE
025064  004737  004264          JSR     PC,WRITAX       ;LOAD DATA INTO AX2-15,AX2-16
025070  004737  004076          JSR     PC,READAX       ;READ AX2-15 AND AX2-16
025074  123737  002370  002374  CMPB    RAX15,WAX15     ;COMPARE LO BYTE DATA READ
025102  001416                  BEQ     6$              ;BR IF DATA MATCHES
025104  013737  002374  002404  MOV     WAX15,GOODAT    ;SET EXPECTED DATA
025112  013737  002370  002406  MOV     RAX15,BADDAT    ;SET ACTUAL DATA
025120  004737  004500          JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                        ;REPORT REG MISCOMPARE
025124                          ERRDF   3,EM3,ERR3
025124  104455                                                                  TRAP    C$ERDF
025126  000003                                                                  .WORD   3
025130  012174                                                                  .WORD   EM3
025132  015114                                                                  .WORD   ERR3
025134                          ESCAPE  SEG
025134  104410                                                                  TRAP    C$ESCAPE
025136  000052                                                                  .WORD   10000$-.
025140  005237  002402  6$:     INC     AXNUM           ;SET AX BYTE NO. = 5
025144  123737  002372  002671  CMPB    RAX16,PATI+5    ;COMPARE HI BYTE DATA READ
025152  001416                  BEQ     9$              ;BR IF DATA MATCHES
025154  005037  002404          CLR     GOODAT
025160  113737  002671  002404  MOVB    PATI+5,GOODAT   ;SET EXPECTED DATA
025166  013737  002372  002406  MOV     RAX16,BADDAT    ;SET ACTUAL DATA
025174  004737  004500          JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                        ;REPORT REG MISCOMPARE
025200                          ERRDF   3,EM3,ERR3
025200  104455                                                                  TRAP    C$ERDF
```

```
  (5)  025202  000003                                                                    .WORD   3
  (5)  025204  012174                                                                    .WORD   EM3
  (5)  025206  015114                                                                    .WORD   ERR3
 8675  025210                        9$:
 8676  025210                                ENDSEG
  (3)  025210                                                                    10000$:
  (3)  025210  104405                                                                    TRAP    C$ESEG
 8677  025212  062701  000002                ADD     #2,R1           ;INCR PATTERN POINTER
 8678  025216  020127  003014                CMP     R1,#PATL        ;SEE IF ALL DATA WRITTEN YET
 8679  025222  103701                        BLO     3$              ;BR IF NOT DONE YET
 8680  025224                        ENDTST
  (3)  025224                                                                    L10041:
  (3)  025224  104401                                                                    TRAP    C$ETST
 8681
 8682
 8683
 8684
 8685
 8686                                ;;*************************************************************************************
 8687                                .SBTTL      TEST 17 - AX0-15,AX0-16 READ/WRITE BIT TEST
 8688                                ;*
 8689                                ;* IN THIS TEST, A MASTER CLEAR IS DONE, AND THEN A WRITE, READ, AND COMPARE
 8690                                ;* ARE PERFORMED IN REGS AX0-15,AX0-16 USING EACH WORD OF PATTERN L.
 8691                                ;* ANY BITS IN AX0-15,AX0-16 WHICH ARE NOT READ/WRITE ARE MASKED OFF (TO 0)
 8692                                ;* IN THE EXPECTED VALUE BEFORE COMPARISON.
 8693                                ;*    PATTERN L =
 8694                                ;*      FOR REG 15: 000,377,000
 8695                                ;*      FOR REG 16: 000,377,000.
 8696                                ;;*************************************************************************************
 8697  025226                        BGNTST
  (3)  025226                                                                    T17::
 8698  025226  004737  003576                JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
 8699  025232  012701  003014                MOV     #PATL,R1        ;INIT DATA PATTERN POINTER
 8700  025236                        3$:
 8701  025236                                BGNSEG
  (3)  025236  104404                                                                    TRAP    C$BSEG
 8702  025240  012737  000000  002402        MOV     #0,AXNUM        ;SET BYTE NO. = 0
 8703  025246  111137  002374                MOVB    (R1),WAX15      ;SET DATA TO WRITE INTO LO BYTE
 8704  025252  116137  000001  002376        MOVB    1(R1),WAX16     ;SET DATA TO WRITE INTO HI BYTE
 8705  025260  143737  002561  002374        BICB    ANBITS+0,WAX15  ;MASK OFF NON-READ/WRITE BITS IN LO BYTE
 8706  025266  143737  002562  002376        BICB    ANBITS+1,WAX16  ;MASK OFF NON-READ/WRITE BITS IN HI BYTE
 8707  025274  004737  004264                JSR     PC,WRITAX       ;LOAD DATA INTO AX0-15,AX0-16
 8708  025300  004737  004076                JSR     PC,READAX       ;READ AX0-15 AND AX0-16
 8709  025304  123737  002370  002374        CMPB    RAX15,WAX15     ;COMPARE LO BYTE DATA READ
 8710  025312  001416                        BEQ     6$              ;BR IF DATA MATCHES
 8711  025314  013737  002374  002404        MOV     WAX15,GOODAT    ;SET EXPECTED DATA
 8712  025322  013737  002370  002406        MOV     RAX15,BADDAT    ;SET ACTUAL DATA
 8713  025330  004737  004500                JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
 8714                                ;REPORT REG MISCOMPARE
 8715  025334                                ERRDF   3,EM3,ERR3
  (4)  025334  104455                                                                    TRAP    C$ERDF
  (5)  025336  000003                                                                    .WORD   3
  (5)  025340  012174                                                                    .WORD   EM3
  (5)  025342  015114                                                                    .WORD   ERR3
 8716  025344                                ESCAPE  SEG
  (3)  025344  104410                                                                    TRAP    C$ESCAPE
```

```
  (3)  025346  000046                                                                    .WORD   10000$-.
8717   025350  005237  002402          6$:     INC     AXNUM           ;SET AX BYTE NO. = 1
8718   025354  123737  002372  002376          CMPB    RAX16,WAX16     ;COMPARE HI BYTE DATA READ
8719   025362  001414                          BEQ     9$              ;BR IF DATA MATCHES
8720   025364  013737  002376  002404          MOV     WAX16,GOODAT    ;SET EXPECTED DATA
8721   025372  013737  002372  002406          MOV     RAX16,BADDAT    ;SET ACTUAL DATA
8722   025400  004737  004500                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
8723                                  ;REPORT REG MISCOMPARE
8724   025404                                 ERRDF   3,EM3,ERR3
  (4)  025404  104455                                                                    TRAP    C$ERDF
  (5)  025406  000003                                                                    .WORD   3
  (5)  025410  012174                                                                    .WORD   EM3
  (5)  025412  015114                                                                    .WORD   ERR3
8725   025414                          9$:
8726   025414                                 ENDSEG
  (3)  025414                                                                    10000$:
  (3)  025414  104405                                                                    TRAP    C$ESEG
8727   025416  062701  000002                  ADD     #2,R1           ;INCR PATTERN POINTER
8728   025422  020127  003022                  CMP     R1,#PATM        ;SEE IF ALL DATA WRITTEN YET
8729   025426  103703                          BLO     3$              ;BR IF NOT DONE YET
8730   025430                          ENDTST
  (3)  025430                                                                    L10042:
  (3)  025430  104401                                                                    TRAP    C$ETST
8731
8732
8733
8734
8735
8736                                    ;;**************************************************************************************
8737                                    .SBTTL      TEST 18 - AX1-15,AX1-16 READ/WRITE BIT TEST
8738                                    ;*
8739                                    ;* IN THIS TEST, A MASTER CLEAR IS DONE, AND THEN A WRITE, READ, AND COMPARE
8740                                    ;* ARE PERFORMED IN REGS AX1-15,AX1-16 USING EACH WORD OF PATTERN K.
8741                                    ;* ANY BITS IN AX1-15,AX1-16 WHICH ARE NOT READ/WRITE ARE MASKED OFF (TO 0)
8742                                    ;* IN THE EXPECTED VALUE BEFORE COMPARISON.
8743                                    ;;**************************************************************************************
8744   025432                           BGNTST
  (3)  025432                                                                    T18::
8745   025432  004737  003576                  JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
8746   025436  012701  002704                  MOV     #PATK,R1        ;INIT DATA PATTERN POINTER
8747   025442                          3$:
8748   025442                                 BGNSEG
  (3)  025442  104404                                                                    TRAP    C$BSEG
8749   025444  012737  000002  002402          MOV     #2,AXNUM        ;SET BYTE NO. = 2
8750   025452  111137  002374                  MOVB    (R1),WAX15      ;SET DATA TO WRITE INTO LO BYTE
8751   025456  116137  000001  002376          MOVB    1(R1),WAX16     ;SET DATA TO WRITE INTO HI BYTE
8752   025464  143737  002563  002374          BICB    ANBITS+2,WAX15  ;MASK OFF NON-READ/WRITE BITS IN LO BYTE
8753   025472  143737  002564  002376          BICB    ANBITS+3,WAX16  ;MASK OFF NON-READ/WRITE BITS IN HI BYTE
8754   025500  004737  004264                  JSR     PC,WRITAX       ;LOAD DATA INTO AX1-15,AX1-16
8755   025504  004737  004076                  JSR     PC,READAX       ;READ AX1-15 AND AX1-16
8756   025510  123737  002370  002374          CMPB    RAX15,WAX15     ;COMPARE LO BYTE DATA READ
8757   025516  001416                          BEQ     6$              ;BR IF DATA MATCHES
8758   025520  013737  002374  002404          MOV     WAX15,GOODAT    ;SET EXPECTED DATA
8759   025526  013737  002370  002406          MOV     RAX15,BADDAT    ;SET ACTUAL DATA
8760   025534  004737  004500                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
8761                                  ;REPORT REG MISCOMPARE
```

```
8762  025540                        ERRDF   3,EM3,ERR3
 (4)  025540  104455                                                    TRAP    C$ERDF
 (5)  025542  000003                                                    .WORD   3
 (5)  025544  012174                                                    .WORD   EM3
 (5)  025546  015114                                                    .WORD   ERR3
8763  025550                        ESCAPE  SEG
 (3)  025550  104410                                                    TRAP    C$ESCAPE
 (3)  025552  000046                                                    .WORD   10000$-.
8764  025554  005237  002402  6$:   INC     AXNUM           ;SET AX BYTE NO. = 3
8765  025560  123737  002372  002376 CMPB    RAX16,WAX16     ;COMPARE HI BYTE DATA READ
8766  025566  001414              BEQ     9$              ;BR IF DATA MATCHES
8767  025570  013737  002376  002404 MOV     WAX16,GOODAT    ;SET EXPECTED DATA
8768  025576  013737  002372  002406 MOV     RAX16,BADDAT    ;SET ACTUAL DATA
8769  025604  004737  004500        JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
8770                        ;REPORT REG MISCOMPARE
8771  025610                        ERRDF   3,EM3,ERR3
 (4)  025610  104455                                                    TRAP    C$ERDF
 (5)  025612  000003                                                    .WORD   3
 (5)  025614  012174                                                    .WORD   EM3
 (5)  025616  015114                                                    .WORD   ERR3
8772  025620                  9$:
8773  025620                        ENDSEG
 (3)  025620                                                    10000$:
 (3)  025620  104405                                                    TRAP    C$ESEG
8774  025622  062701  000002        ADD     #2,R1           ;INCR PATTERN POINTER
8775  025626  020127  003014        CMP     R1,#PATL        ;SEE IF ALL DATA WRITTEN YET
8776  025632  103703              BLO     3$              ;BR IF NOT DONE YET
8777  025634                  ENDTST
 (3)  025634                                                    L10043:
 (3)  025634  104401                                                    TRAP    C$ETST
8778
8779
8780
8781
8782
8783                    ;;*******************************************************************************
8784                    .SBTTL      TEST 19 - AX3-15,AX3-16 READ/WRITE BIT TEST
8785                    ;*
8786                    ;* IN THIS TEST A MASTER CLEAR IS DONE AND THEN A WRITE, READ, AND COMPARE ARE
8787                    ;* PERFORMED IN REGS AX3-15,AX3-16 USING EACH WORD OF PATTERN V FOR WRITING,
8788                    ;* AND PATTERN U FOR COMPARING.
8789                    ;* ANY BITS IN AX3-15,AX3-16 WHICH ARE NOT READ/WRITE ARE MASKED OFF (TO 0)
8790                    ;* IN THE EXPECTED VALUE BEFORE COMPARISON.
8791                    ;*   PATTERN V =
8792                    ;*      FOR REG 15 : 000,333,331,323,313,233,133,000,000,000,000,
8793                    ;*                   000,000,000,000,000,000,000,000
8794                    ;*      FOR REG 16 : 000,000,000,000,000,000,000,001,002,004,040,
8795                    ;*                   100,200,346,345,343,307,247,147
8796                    ;*   PATTERN U =
8797                    ;*      FOR REG 15 : 000,001,013,011,021,101,301,000,000,000,000,
8798                    ;*                   000,000,000,000,000,0C0,000,000
8799                    ;*      FOR REG 16 : 000,000,000,000,000,000,000,001,002,004,040,
8800                    ;*                   100,200,346,345,343,307,247,147
8801                    ;*******************************************************************************
8802  025636            BGNTST
 (3)  025636                                                    T19::
```

```
 8803  025636  004737  003576                JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
 8804  025642  142777  000010  154600        BICB    #LULOOP,@BSEL1  ;CLEAR LULOOP
 8805  025650  012702  003152                MOV     #PATV,R2        ;INIT PATTERN V POINTER
 8806  025654  012701  003104                MOV     #PATU,R1        ;INIT PATTERN U POINTER
 8807  025660                          3$:
 8808  025660                                BGNSEG
   (3) 025660  104404                                                  TRAP    C$BSEG
 8809  025662  012737  000006  002402        MOV     #6,AXNUM        ;SET BYTE NO. = 6
 8810  025670  111237  002374                MOVB    (R2),WAX15      ;SET DATA TO WRITE INTO LO BYTE
 8811  025674  116237  000001  002376        MOVB    1(R2),WAX16     ;SET DATA TO WRITE INTO HI BYTE
 8812  025702  004737  004264                JSR     PC,WRITAX       ;LOAD DATA INTO AX3-15,AX3-16
 8813  025706  004737  004076                JSR     PC,READAX       ;READ AX3-15 AND AX3-16
 8814  025712  132737  000001  002374        BITB    #TEST,WAX15     ;SEE IF AN INTERFACE IS SELECTED
 8815  025720  001003                        BNE     4$              ;BR IF YES
 8816  025722  142737  000332  002370        BICB    #AX315U,RAX15   ;MASK OFF UNPREDICTABLE BITS
 8817  025730  123711  002370          4$:   CMPB    RAX15,(R1)      ;COMPARE LO BYTE DATA READ
 8818  025734  001417                        BEQ     6$              ;BR IF DATA MATCHES
 8819  025736  005037  002404                CLR     GOODAT
 8820  025742  111137  002404                MOVB    (R1),GOODAT     ;SET EXPECTED DATA
 8821  025746  013737  002370  002406        MOV     RAX15,BADDAT    ;SET ACTUAL DATA
 8822  025754  004737  004500                JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
 8823                          ;REPORT REG MISCOMPARE
 8824  025760                                ERRDF   3,EM3,ERR3
   (4) 025760  104455                                                  TRAP    C$ERDF
   (5) 025762  000003                                                  .WORD   3
   (5) 025764  012174                                                  .WORD   EM3
   (5) 025766  015114                                                  .WORD   ERR3
 8825  025770                                ESCAPE  SEG
   (3) 025770  104410                                                  TRAP    C$ESCAPE
   (3) 025772  000052                                                  .WORD   10000$-.
 8826  025774  005237  002402          6$:   INC     AXNUM           ;SET AX BYTE NO. = 7
 8827  026000  123761  002372  000001        CMPB    RAX16,1(R1)     ;COMPARE HI BYTE DATA READ
 8828  026006  001416                        BEQ     9$              ;BR IF DATA MATCHES
 8829  026010  005037  002404                CLR     GOODAT
 8830  026014  116137  000001  002404        MOVB    1(R1),GOODAT    ;SET EXPECTED DATA
 8831  026022  013737  002372  002406        MOV     RAX16,BADDAT    ;SET ACTUAL DATA
 8832  026030  004737  004500                JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
 8833                          ;REPORT REG MISCOMPARE
 8834  026034                                ERRDF   3,EM3,ERR3
   (4) 026034  104455                                                  TRAP    C$ERDF
   (5) 026036  000003                                                  .WORD   3
   (5) 026040  012174                                                  .WORD   EM3
   (5) 026042  015114                                                  .WORD   ERR3
 8835  026044                          9$:
 8836  026044                                ENDSEG
   (3) 026044                                                      10000$:
   (3) 026044  104405                                                  TRAP    C$ESEG
 8837  026046  062702  000002                ADD     #2,R2           ;INCR PATTERN V POINTER
 8838  026052  062701  000002                ADD     #2,R1           ;INCR PATTERN U POINTER
 8839  026056  020127  003152                CMP     R1,#PATV        ;SEE IF ALL DATA WRITTEN YET
 8840  026062  103676                        BLO     3$              ;BR IF NOT DONE YET
 8841  026064                          ENDTST
   (3) 026064                                                      L10044:
   (3) 026064  104401                                                  TRAP    C$ETST
 8842
 8843
```

```
                        ;;*************************************************************************************
                        .SBTTL      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).
                        ;;*************************************************************************************
026066                  BGNTST
(3) 026066                                                                          T20::
026066  004737  003576              JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
026072  012701  003050              MOV     #PATO,R1        ;INIT PAT O POINTER
026076  012702  003066              MOV     #PATP,R2        ;INIT PAT P POINTER
026102  012737  000017  002400      MOV     #17,REGNUM      ;SET LU REG NO. = 17
026110  012737  000005  002402      MOV     #5,AXNUM        ;SET AX BYTE NO. = 5 FOR AX2-16
                        ;-------------------------------------------------------------------------
                        ; WRITE REG 17, READ AND COMPARE AX2-16
                        ;-------------------------------------------------------------------------
026116                          BGNSUB
(3) 026116                                                                                  T20.1:
(3) 026116  104402                                                                                  TRAP    C$BSUB
026120                  3$:
026120                          BGNSEG
(3) 026120  104404                                                                                  TRAP    C$BSEG
026122  111137  002366              MOVB    (R1),WRIBYT     ;SET BYTE TO BE WRITTEN
026126  004737  003722              JSR     PC,WRITLU       ;WRITE DATA BYTE INTO REG 17
026132  004737  004076              JSR     PC,READAX       ;READ AX2
026136  123712  002372              CMPB    RAX16,(R2)      ;COMPARE AX2-16 TO EXPECTED DATA
026142  001421                      BEQ     6$              ;BR IF DATA MATCHES
026144  005037  002410              CLR     LOADAT
026150  111137  002410              MOVB    (R1),LOADAT     ;SET DATA WHICH WAS WRITTEN
026154  005037  002404              CLR     GOODAT
026160  111237  002404              MOVB    (R2),GOODAT     ;SET EXPECTED DATA READ
026164  013737  002372  002406      MOV     RAX16,BADDAT    ;SET ACTUAL DATA READ
026172  004737  004500              JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                        ;REPORT REG MISCOMPARE
026176                          ERRDF   3,EM3,ERR5
(4) 026176  104455                                                                                  TRAP    C$ERDF
(5) 026200  000003                                                                                  .WORD   3
(5) 026202  012174                                                                                  .WORD   EM3
(5) 026204  016254                                                                                  .WORD   ERR5
026206                  6$:
026206                          ENDSEG
(3) 026206                                                                                  10000$:
(3) 026206  104405                                                                                  TRAP    C$ESEG
026210  005201                  INC     R1              ;INCR PAT O POINTER
026212  005202                  INC     R2              ;INCR PAT P POINTER
026214  020127  003066          CMP     R1,#PATP        ;SEE IF ALL BYTES LOADED YET
026220  103737                  BLO     3$              ;BR IF NOT
026222                          ENDSUB
```

```
  (3)  026222                                                                    L10046:
  (3)  026222  104403                                                                    TRAP    C$ESUB
8890
8891                                ;-------------------------------------------------------------------------
8892                                ; LOAD REG 17, DO MASTER CLEAR, READ AND COMPARE AX2-16
8893                                ;-------------------------------------------------------------------------
8893  026224                              BGNSUB
  (3)  026224                                                                    T20.2:
  (3)  026224  104402                                                                    TRAP    C$BSUB
8894  026226  112737  000375  002366       MOVB    #375,WRIBYT     ;SET DATA TO BE LOADED
8895  026234  004737  003722              JSR     PC,WRITLU       ;LOAD DATA INTO REG 17
8896  026240  004737  003576              JSR     PC,MSTCLR       ;PERFORM MASTER CLEAR
8897  026244  004737  004076              JSR     PC,READAX       ;READ AX2-15,AX2-16
8898  026250  123737  002372  002671       CMPB    RAX16,PATI+5    ;SEE IF AX2-16 WAS INIT'D CORRECTLY
8899  026256  001416                      BEQ     6$              ;BR IF YES
8900  026260  005037  002404              CLR     GOODAT
8901  026264  113737  002671  002404       MOVB    PATI+5,GOODAT   ;SET EXPECTED DATA
8902  026272  013737  002372  002406       MOV     RAX16,BADDAT    ;SET ACTUAL DATA
8903  026300  004737  004500              JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
8904                                ;REPORT REG NOT INITIALIZED BY MASTER CLEAR
8905  026304                              ERRDF   2,EM2,ERR3
  (4)  026304  104455                                                                    TRAP    C$ERDF
  (5)  026306  000002                                                                    .WORD   2
  (5)  026310  012135                                                                    .WORD   EM2
  (5)  026312  015114                                                                    .WORD   ERR3
8906  026314                        6$:
8907  026314                              ENDSUB
  (3)  026314                                                                    L10047:
  (3)  026314  104403                                                                    TRAP    C$ESUB
8908  026316                        ENDTST
  (3)  026316                                                                    L10045:
  (3)  026316  104401                                                                    TRAP    C$ETST
8909
8910
8911
8912
8913
8914                                ;;*************************************************************************
8915                                .SBTTL      TEST 21 - TRANSMITTER BUFFER DATA TEST
8916                                ;* A MASTER CLEAR IS DONE FIRST, AND THEN A BYTE OF PATTERN N IS LOADED INTO
8917                                ;* REG 11 AND THE NEXT BYTE IS LOADED TWICE INTO REG 10. THE PROGRAM THEN WAITS
8918                                ;* AT LEAST 50 MICRO-SEC, AND THEN IT READS AND COMPARES AX1-15 TO THE BYTE
8919                                ;* WHICH WAS LOADED INTO REG 10, AND IT READS AND COMPARES AX1-16 TO THE BYTE
8920                                ;* WHICH WAS LOADED INTO REG 11. THIS PROCESS IS REPEATED (INCLUDING THE MASTER
8921                                ;* CLEAR) FOR EACH PAIR OF BYTES IN PATTERN N.
8922                                ;*   PATTERN N =
8923                                ;*     FOR REG 10: 000,125,252,377,000,000,000
8924                                ;*     FOR REG 11: 000,000,000,000,005,012,017
8925                                ;;*************************************************************************
8926  026320                        BGNTST
  (3)  026320                                                                    T21::
8927  026320  012701  003032              MOV     #PATN,R1        ;INIT PATTERN POINTER
8928  026324  012737  026566  002362       MOV     #A2,RETADR      ;SET SUBROUTINE ERROR RETURN ADDRESS
8929  026332                              BGNSUB
  (3)  026332                                                                    T21.1:
  (3)  026332  104402                                                                    TRAP    C$BSUB
8930  026334  004737  003576        3$:   JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
```

```
 8931  026340  004737  004634                JSR     PC,OSIRDY       ;CHECK ORDY AND OCOR FOR EXPECTED STATES
 8932  026344  000001                        1
 8933  026346  012737  000011  002400        MOV     #11,REGNUM      ;SET LU REG NO. = 11
 8934  026354  111137  002366                MOVB    (R1),WRIBYT     ;SET DATA BYTE TO BE WRITTEN
 8935  026360  004737  003722                JSR     PC,WRITLU       ;WRITE BYTE INTO REG 11
 8936  026364  012737  000010  002400        MOV     #10,REGNUM      ;SET LU REG NO. = 10
 8937  026372  116137  000001  002366        MOVB    1(R1),WRIBYT    ;SET DATA BYTE TO BE WRITTEN
 8938  026400  004737  003722                JSR     PC,WRITLU       ;WRITE BYTE INTO REG 10
 8939  026404  004737  003722                JSR     PC,WRITLU       ;WRITE IT AGAIN (SO 2 ENTRIES ARE IN SILO)
 8940  026410  004737  005120                JSR     PC,WAIT50       ;WAIT FOR SILO DATA TO RIPPLE
 8941  026414  004737  004634                JSR     PC,OSIRDY       ;CHECK ORDY AND OCOR FOR EXPECTED STATES
 8942  026420  000003                        3
 8943  026422  012737  000002  002402        MOV     #2,AXNUM        ;SET BYTE NO. FOR AX1-15
 8944  026430  004737  004076                JSR     PC,READAX       ;READ AX1-15, AX1-16
 8945  026434  123761  002370  000001        CMPB    RAX15,1(R1)     ;COMPARE AX1-15 TO EXPECTED
 8946  026442  001420                        BEQ     6$              ;BR IF MATCH
 8947  026444  005037  002404                CLR     GOODAT
 8948  026450  116137  000001  002404        MOVB    1(R1),GOODAT    ;SET EXPECTED DATA
 8949  026456  013737  002370  002406        MOV     RAX15,BADDAT    ;SET ACTUAL DATA
 8950  026464  004737  004500                JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
 8951                          ;REPORT REG MISCOMPARE
 8952  026470                                ERRDF   3,EM3,ERR3
   (4) 026470  104455                                                        TRAP    C$ERDF
   (5) 026472  000003                                                        .WORD   3
   (5) 026474  012174                                                        .WORD   EM3
   (5) 026476  015114                                                        .WORD   ERR3
 8953  026500                                ESCAPE  SUB
   (3) 026500  104410                                                        TRAP    C$ESCAPE
   (3) 026502  000064                                                        .WORD   L10051-.
 8954  026504  005237  002402        6$:     INC     AXNUM           ;INCR AX BYTE NO.
 8955  026510  123711  002372                CMPB    RAX16,(R1)      ;COMPARE AX1-16 TO EXPECTED
 8956  026514  001417                        BEQ     9$              ;BR IF MATCH
 8957  026516  005037  002404                CLR     GOODAT
 8958  026522  111137  002404                MOVB    (R1),GOODAT     ;SET EXPECTED DATA
 8959  026526  013737  002372  002406        MOV     RAX16,BADDAT    ;SET ACTUAL DATA
 8960  026534  004737  004500                JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
 8961                          ;REPORT REG MISCOMPARE
 8962  026540                                ERRDF   3,EM3,ERR3
   (4) 026540  104455                                                        TRAP    C$ERDF
   (5) 026542  000003                                                        .WORD   3
   (5) 026544  012174                                                        .WORD   EM3
   (5) 026546  015114                                                        .WORD   ERR3
 8963  026550                                ESCAPE  SUB
   (3) 026550  104410                                                        TRAP    C$ESCAPE
   (3) 026552  000014                                                        .WORD   L10051-.
 8964  026554  062701  000002        9$:     ADD     #2,R1           ;INCR DATA PATTERN POINTER
 8965  026560  020127  003050                CMP     R1,#PAT0        ;SEE IF ALL DATA BYTES WRITTEN YET
 8966  026564  103663                        BLO     3$              ;BR IF NOT DONE YET
 8967  026566                          A2:
 8968  026566                                ENDSUB
   (3) 026566                                                                L10051:
   (3) 026566  104403                                                        TRAP    C$ESUB
 8969  026570                          ENDTST
   (3) 026570                                                                L10050:
   (3) 026570  104401                                                        TRAP    C$ETST
 8970
```

```
                                ;;*****************************************************************************
                                .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.
                                ;;*****************************************************************************
026572                          BGNTST
(3) 026572                                                                  T22::
026572  012737  027246  002362          MOV     #A3,RETADR      ;SET SUBR ERROR RETURN ADDR
                                ;-----------------------------------------------------------------------------
                                ; SET MASTER CLEAR, CHECK FOR ORDY=1, OCOR=0
                                ;-----------------------------------------------------------------------------
026600  004737  003576                  JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
026604  004737  004634                  JSR     PC,OSIRDY       ;CHK ORDY=1, OCOR=0
026610  000001                          1
                                ;-----------------------------------------------------------------------------
                                ; LOAD 2 SOM CHARS, ALLOW SILO TO RIPPLE, CHK ORDY=1, OCOR=1
                                ;-----------------------------------------------------------------------------
026612  012737  000400  002422          MOV     #TXSOM,TXWORD   ;SET DATA TO WRITE INTO SILO
026620  004737  005146                  JSR     PC,LDTXSI       ;LOAD THE SILO WITH SOM
026624  004737  005146                  JSR     PC,LDTXSI       ;LOAD ANOTHER SOM
026630  004737  005120                  JSR     PC,WAIT50       ;WAIT FOR DATA TO RIPPLE
026634  004737  004634                  JSR     PC,OSIRDY       ;CHK ORDY=1, OCOR=1
026640  000003                          3
                                ;-----------------------------------------------------------------------------
                                ; CLOCK LINE UNIT, CHK FOR OCOR = 0 WITHIN 3 CYCLES
                                ;-----------------------------------------------------------------------------
026642  005001                          CLR     R1              ;INIT CYCLE COUNTER TO 0
026644  012737  000017  002400          MOV     #17,REGNUM      ;SET REG NO. = 17
026652  004737  005226          3$:     JSR     PC,STPLU        ;STEP LU 1 CYCLE
026656  000001                          1
026660  004737  003644                  JSR     PC,READLU       ;READ REG 17
026664  132737  000020  002364          BITB    #OCOR,REDBYT    ;SEE IF OCOR = 0 YET
026672  001404                          BEQ     6$              ;BR IF OCOR = 0
026674  005201                          INC     R1              ;INCR CYCLE COUNT
026676  020127  000003                  CMP     R1,#3           ;SEE IF 3 CYCLES DONE YET
026702  002763                          BLT     3$              ;BR IF NO
026704  004737  004634          6$:     JSR     PC,OSIRDY       ;CHK ORDY=1, OCOR=0
026710  000001                          1
                                ;-----------------------------------------------------------------------------
                                ; LOAD 64 BINARY COUNT CHARS INTO SILO, CHK ORDY=0
                                ;-----------------------------------------------------------------------------
```

```
 9026  026712  005003                          CLR     R3              ;INIT PATTERN FOR WRITING
 9027  026714  010337  002422            8$:   MOV     R3,TXWORD       ;SET DATA TO BE WRITTEN
 9028  026720  004737  005146                  JSR     PC,LDTXSI       ;LOAD DATA CHAR INTO TX SILO
 9029  026724  004737  005120                  JSR     PC,WAIT50       ;WAIT FOR DATA TO RIPPLE IN SILO
 9030  026730  020327  000077                  CMP     R3,#63.         ;SEE IF 64TH CHAR JUST LOADED
 9031  026734  001004                          BNE     9$              ;BR IF NO
 9032  026736  012737  000002  026760          MOV     #2,14$          ;SET UP TO CHK ORDY=0,OCOR=1
 9033  026744  000403                          BR      12$
 9034  026746  012737  000003  026760    9$:   MOV     #3,14$          ;SET UP TO CHK ORDY=1,OCOR=1
 9035  026754  004737  004634            12$:  JSR     PC,OSIRDY       ;CHK ORDY, OCOR
 9036  026760  000000                    14$:  .WORD   0
 9037  026762  005203                          INC     R3              ;INCR PATTERN FOR WRITES
 9038  026764  020327  000100                  CMP     R3,#64.         ;SEE IF 64 CHARS LOADED YET
 9039  026770  002751                          BLT     8$              ;BR IF NO
 9040                                  ;-------------------------------------------------------------------------
 9041                                  ; CLOCK LINE UNIT, CHECK ORDY = 1 WITHIN 8 CYCLES
 9042                                  ;-------------------------------------------------------------------------
 9043  026772  012737  000011  002400          MOV     #11,REGNUM      ;SET REG NO. = 11
 9044  027000  005001                          CLR     R1              ;INIT CYCLE COUNT
 9045  027002  004737  005226            16$:  JSR     PC,STPLU        ;CLOCK LU FOR 1 CYCLE
 9046  027006  000001                          1
 9047  027010  004737  003644                  JSR     PC,READLU       ;READ REG 11
 9048  027014  132737  000020  002364          BITB    #ORDY,REDBYT    ;SEE IF ORDY = 1 YET
 9049  027022  001004                          BNE     19$             ;BR IF YES
 9050  027024  005201                          INC     R1              ;INCR CYCLE COUNT
 9051  027026  020127  000010                  CMP     R1,#8.          ;SEE IF 8 CYCLES YET
 9052  027032  002763                          BLT     16$             ;BR IF NOT YET
 9053  027034  004737  004634            19$:  JSR     PC,OSIRDY       ;CHK ORDY = 1, OCOR = 1
 9054  027040  000003                          3
 9055                                  ;-------------------------------------------------------------------------
 9056                                  ; READ AND COMPARE FIRST CHARACTER IN AX1-15
 9057                                  ;-------------------------------------------------------------------------
 9058  027042  005004                          CLR     R4              ;INIT PATTERN FOR READING
 9059  027044  012737  000002  002402          MOV     #2,AXNUM        ;SET AX BYTE NO. FOR AX1-15
 9060  027052  004737  004076                  JSR     PC,READAX       ;READ AX1-15
 9061  027056  123704  002370                  CMPB    RAX15,R4        ;COMPARE AX1-15 TO EXPECTED
 9062  027062  001415                          BEQ     20$             ;BR IF MATCH
 9063  027064  010437  002404                  MOV     R4,GOODAT       ;SET EXPECTED DATA
 9064  027070  013737  002370  002406          MOV     RAX15,BADDAT    ;SET ACTUAL DATA
 9065  027076  004737  004500                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
 9066                                  ;REPORT REG MISCOMPARE
 9067  027102                                  ERRDF   3,EM3,ERR3
   (4) 027102  104455                                                                      TRAP    C$ERDF
   (5) 027104  000003                                                                      .WORD   3
   (5) 027106  012174                                                                      .WORD   EM3
   (5) 027110  015114                                                                      .WORD   ERR3
 9068  027112                                  ESCAPE  TST
   (3) 027112  104410                                                                      TRAP    C$ESCAPE
   (3) 027114  000132                                                                      .WORD   L10052-.
 9069  027116                                20$:
 9070                                  ;-------------------------------------------------------------------------
 9071                                  ; LOAD AND COMPARE REST OF CHARS, MONITOR ORDY, OCOR
 9072                                  ;-------------------------------------------------------------------------
 9073  027116  020327  000377            24$:  CMP     R3,#255.        ;SEE IF ALL CHARS LOADED YET
 9074  027122  003010                          BGT     26$             ;BR IF YES
 9075  027124  010337  002422                  MOV     R3,TXWORD       ;SET DATA TO BE WRITTEN
```

```
 9076  027130  004737  005146                 JSR     PC,LDTXSI       ;LOAD DATA CHAR INTO TX SILO
 9077  027134  005203                         INC     R3              ;INCR DATA TO BE WRITTEN
 9078  027136  004737  004634                 JSR     PC,OSIRDY       ;CHK ORDY=0, OCOR=1
 9079  027142  000002                         2
 9080  027144  005204                 26$:    INC     R4              ;INCR PAT FOR READING
 9081  027146  004737  005226                 JSR     PC,STPLU        ;CLOCK LINE UNIT FOR 8 CYCLES
 9082  027152  000010                         8.
 9083  027154  004737  004076                 JSR     PC,READAX       ;READ AX1-15
 9084  027160  123704  002370                 CMPB    RAX15,R4        ;COMPARE AX1-15 TO EXPECTED
 9085  027164  001415                         BEQ     27$             ;BR IF MATCH
 9086  027166  010437  002404                 MOV     R4,GOODAT       ;SET EXPECTED DATA
 9087  027172  013737  002370  002406         MOV     RAX15,BADDAT    ;SET ACTUAL DATA
 9088  027200  004737  004500                 JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
 9089                                 ;REPORT REG MISCOMPARE
 9090  027204                                 ERRDF   3,EM3,ERR3
   (4) 027204  104455                                                                      TRAP    C$ERDF
   (5) 027206  000003                                                                      .WORD   3
   (5) 027210  012174                                                                      .WORD   EM3
   (5) 027212  015114                                                                      .WORD   ERR3
 9091  027214                                 ESCAPE  TST
   (3) 027214  104410                                                                      TRAP    C$ESCAPE
   (3) 027216  000030                                                                      .WORD   L10052-.
 9092  027220  020427  000377         27$:    CMP     R4,#255.        ;SEE IF WE READ LAST CHAR YET
 9093  027224  001004                         BNE     29$             ;BR IF NOT
 9094  027226  004737  004634                 JSR     PC,OSIRDY       ;CHK ORDY=1, OCOR=0
 9095  027232  000001                         1
 9096  027234  000404                         BR      A3
 9097  027236  004737  004634         29$:    JSR     PC,OSIRDY       ;CHK ORDY=1, OCOR=1
 9098  027242  000003                         3
 9099  027244  000724                         BR      24$             ;CONTINUE
 9100  027246                         A3:
 9101  027246                         ENDTST
   (3) 027246                                                                      L10052:
   (3) 027246  104401                                                                      TRAP    C$ETST
 9102
 9103
 9104
 9105
 9106
 9107                                 ;;*****************************************************************************
 9108                                 .SBTTL      TEST 23 - TX MSG TIMING TEST, CHAR MODE, WITH CRC
 9109                                 ;*
 9110                                 ;* IN THIS TEST, AN ENTIRE MESSAGE IS TRANSMITTED (USING STEPLU AND LULOOP)
 9111                                 ;* AND THE PROGRAM MONITORS THE OCCURRENCE OF USYRT TX BUFFER EMPTY FLAGS
 9112                                 ;* (BY SCANNING ORDY AND OCOR) AND OACT, AT EACH STEP. THE TEST IS DONE IN
 9113                                 ;* CHARACTER ORIENTED PROTOCOL MODE, USING 8-BIT CHARS AND CRC-16.
 9114                                 ;* THE FOLLOWING STEPS ARE DONE:
 9115                                 ;* A MASTER CLEAR IS DONE, AND THE LINE UNIT IS PLACED IN CHAR MODE.
 9116                                 ;* SOM IS SET TWICE TO SEND 2 SYNCH CHARS. THEN, 2 000 CHARS ARE SENT, AND
 9117                                 ;* THEN 2 TERMINATING SYNCHS ARE SENT.
 9118                                 ;* THE TRANSMITTER IS THEN DISABLED, USING OC, AND OACT IS MONITORED FOR THE
 9119                                 ;* CLEARED STATE AFTER THE 3RD SYNCH COMPLETES.
 9120                                 ;;*****************************************************************************
 9121  027250                         BGNTST
   (3) 027250                                                                      T23::
 9122  027250  012737  027362  002362         MOV     #A4,RETADR      ;SET TEST EXIT ADDRESS FOR ERRORS
```

```
 9123  027256  004737  005512                JSR     PC,INITRN       ;DO MASTER CLR, LOAD 2 SOM'2
 9124  027262  000226                        SYNCH
 9125  027264  000011                        STRIP!DDCMP
 9126  027266  004737  006074                JSR     PC,TXCHAR       ;LOAD A 000 CHAR, TX FIRST SYNCH (226)
 9127  027272  000000                        000
 9128  027274  100010                        CHPCHK!8.
 9129  027276  004737  006074                JSR     PC,TXCHAR       ;LOAD 2ND 000 CHAR, TX 2ND SYNCH
 9130  027302  000000                        000
 9131  027304  000010                        8.
 9132  027306  004737  006074                JSR     PC,TXCHAR       ;LOAD EOM CHAR, TX FIRST 000 CHAR
 9133  027312  001000                        TXEOM
 9134  027314  000010                        8.
 9135  027316  004737  006074                JSR     PC,TXCHAR       ;LOAD EOM CHAR, TX 2ND 000 CHAR
 9136  027322  001000                        TXEOM
 9137  027324  000010                        8.
 9138  027326  004737  006074                JSR     PC,TXCHAR       ;LOAD EOM, TX CRC-16 CHAR
 9139  027332  001000                        TXEOM
 9140  027334  000020                        16.
 9141  027336  004737  006074                JSR     PC,TXCHAR       ;LOAD EOM, TX FIRST TERMINATING SYNCH
 9142  027342  001000                        TXEOM
 9143  027344  000010                        8.
 9144  027346  004737  006074                JSR     PC,TXCHAR       ;LOAD EOM, TX 2ND TERMINATING SYNCH
 9145  027352  001000                        TXEOM
 9146  027354  000010                        8.
 9147  027356  004737  006246                JSR     PC,ENDTRN       ;SET OC, MONITOR OCOR
 9148  027362                          A4:
 9149  027362  004737  003576                JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR TO CLEAN UP
 9150  027366                          ENDTST
   (3) 027366                                                                  L10053:
   (3) 027366  104401                                                                TRAP    C$ETST
 9151
 9152
 9153
 9154
 9155
 9156                                ;;*************************************************************************
 9157                                .SBTTL      TEST 24 - TX MSG TIMING TEST, BIT MODE, WITH CRC
 9158                                ;*
 9159                                ;* IN THIS TEST, AN ENTIRE MESSAGE IS TRANSMITTED (USING STEPLU AND LULOOP)
 9160                                ;* AND THE PROGRAM MONITORS THE OCCURRENCE OF USYRT TX BUFFER EMPTY FLAGS
 9161                                ;* (BY SCANNING ORDY AND OCOR) AND OACT, AT EACH STEP. THE TEST IS DONE IN
 9162                                ;* BIT ORIENTED PROTOCOL MODE, USING 8-BIT CHARS AND CRC-CCITT-1.
 9163                                ;* THE FOLLOWING STEPS ARE DONE:
 9164                                ;* A MASTER CLEAR IS DONE, AND THE LINE UNIT IS PLACED IN BIT MODE.
 9165                                ;* SOM IS SET TWICE TO SEND 2 FLAG CHARS. THEN, 2 000 CHARS ARE SENT, AND
 9166                                ;* THEN 2 TERMINATING FLAGS ARE SENT.
 9167                                ;* THE TRANSMITTER IS THEN DISABLED, USING OC, AND OACT IS MONITORED FOR THE
 9168                                ;* CLEARED STATE.
 9169                                ;;*************************************************************************
 9170  027370                        BGNTST
   (3) 027370                                                                  T24::
 9171  027370  012737  027472  002362          MOV     #A5,RETADR      ;SET TEST EXIT ADDRESS FOR ERRORS
 9172  027376  004737  005512                JSR     PC,INITRN       ;DO MASTER CLR, LOAD 2 SOM'2
 9173  027402  000000                        000
 9174  027404  000000                        000
 9175  027406  004737  006074                JSR     PC,TXCHAR       ;LOAD A 000 CHAR, TX FIRST FLAG
```

```
 9176  027412  000000                        000
 9177  027414  100010                        CHPCHK!8.
 9178  027416  004737  006074                JSR     PC,TXCHAR       ;LOAD 2ND 000 CHAR, TX 2ND FLAG
 9179  027422  000000                        000
 9180  027424  000010                        8.
 9181  027426  004737  006074                JSR     PC,TXCHAR       ;LOAD EOM CHAR, TX FIRST 000 CHAR
 9182  027432  001000                        TXEOM
 9183  027434  000010                        8.
 9184  027436  004737  006074                JSR     PC,TXCHAR       ;LOAD EOM, TX 2ND 000 CHAR AND CRC-CCITT-1 CHAR
 9185  027442  001000                        TXEOM
 9186  027444  000030                        24.
 9187  027446  004737  006074                JSR     PC,TXCHAR       ;LOAD EOM, TX FIRST TERMINATING FLAG
 9188  027452  001000                        TXEOM
 9189  027454  000010                        8.
 9190  027456  004737  006074                JSR     PC,TXCHAR       ;LOAD EOM, TX 2ND TERMINATING FLAG
 9191  027462  001000                        TXEOM
 9192  027464  000010                        8.
 9193  027466  004737  006246                JSR     PC,ENDTRN       ;SET OC, MONITOR OCOR
 9194  027472                          A5:
 9195  027472  004737  003576                JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR TO CLEAN UP
 9196  027476                          ENDTST
  (3)  027476                                                                     L10054:
  (3)  027476  104401                                                                     TRAP    C$ETST
 9197
 9198
 9199
 9200
 9201
 9202                                   ;;*****************************************************************************
 9203                                   .SBTTL      TEST 25 - TX MSG TIMING TEST, CHAR MODE, WITH NO CRC
 9204                                   ;*
 9205                                   ;* IN THIS TEST, AN ENTIRE MESSAGE IS TRANSMITTED (USING STEPLU AND LULOOP)
 9206                                   ;* AND THE PROGRAM MONITORS THE OCCURRENCE OF USYRT TX BUFFER EMPTY FLAGS
 9207                                   ;* (BY SCANNING ORDY AND OCOR) AND OACT, AT EACH STEP. THE TEST IS DONE IN
 9208                                   ;* CHARACTER ORIENTED PROTOCOL MODE, USING 8-BIT CHARS AND NO ERROR CHECKING.
 9209                                   ;* THE FOLLOWING STEPS ARE DONE:
 9210                                   ;* A MASTER CLEAR IS DONE, AND THE LINE UNIT IS PLACED IN CHAR MODE.
 9211                                   ;* SOM IS SET TWICE TO SEND 2 SYNCH CHARS. THEN, 2 000 CHARS ARE SENT, AND
 9212                                   ;* THEN 2 TERMINATING SYNCHS ARE SENT.
 9213                                   ;* THE TEST IS PERFORMED WITH TXEN (REG14, BIT6) SET, AND THE PROGRAM CHECKS
 9214                                   ;* THAT THIS HOLDS RTS HIGH PAST THE END OF THE MESSAGE.
 9215                                   ;* THE TRANSMITTER IS THEN DISABLED, USING OC, AND OACT IS MONITORED FOR THE
 9216                                   ;* CLEARED STATE.
 9217                                   ;;*****************************************************************************
 9218  027500                           BGNTST
  (3)  027500                                                                     T25::
 9219  027500  012737  027666  002362          MOV     #A6,RETADR      ;SET TEST EXIT ADDRESS FOR ERRORS
 9220  027506  004737  005512                  JSR     PC,INITRN       ;DO MASTER CLR, LOAD 2 SOM'2
 9221  027512  000226                          SYNCH
 9222  027514  000311                          CRC2!CRC1!STRIP!DDCMP
 9223  027516  012737  000014  002400          MOV     #14,REGNUM      ;SET REG NO. = 14
 9224  027524  012737  000100  002366          MOV     #TXEN,WRIBYT    ;SET TXEN BIT
 9225  027532  004737  003722                  JSR     PC,WRITLU       ;LOAD TXEN BIT IN REG 14
 9226  027536  004737  006074                  JSR     PC,TXCHAR       ;LOAD A 000 CHAR, TX FIRST SYNCH (226)
 9227  027542  000000                          000
 9228  027544  100010                          CHPCHK!8.
```

```
 9229  027546  004737  006074                JSR     PC,TXCHAR       ;LOAD 2ND 000 CHAR, TX 2ND SYNCH
 9230  027552  000000                        000
 9231  027554  000010                        8.
 9232  027556  004737  006074                JSR     PC,TXCHAR       ;LOAD EOM CHAR, TX FIRST 000 CHAR
 9233  027562  001000                        TXEOM
 9234  027564  000010                        8.
 9235  027566  004737  006074                JSR     PC,TXCHAR       ;LOAD EOM CHAR, TX 2ND 000 CHAR
 9236  027572  001000                        TXEOM
 9237  027574  000010                        8.
 9238  027576  004737  006074                JSR     PC,TXCHAR       ;LOAD EOM, TX FIRST TERMINATING SYNCH
 9239  027602  001000                        TXEOM
 9240  027604  000010                        8.
 9241  027606  004737  006074                JSR     PC,TXCHAR       ;LOAD EOM, TX 2ND TERMINATING SYNCH
 9242  027612  001000                        TXEOM
 9243  027614  000010                        8.
 9244  027616  004737  005226                JSR     PC,STPLU        ;CLK PAST END OF MSG
 9245  027622  000030                        24.
 9246  027624  012737  000013  002400        MOV     #13,REGNUM      ;SET REG NO. = 13
 9247  027632  004737  003644                JSR     PC,READLU       ;READ REG 13
 9248  027636  032737  000040  002364        BIT     #RTS,REDBYT     ;CHK FOR RTS STILL SET
 9249  027644  001006                        BNE     3$              ;BR IF RTS SET
 9250  027646  004737  004500                JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
 9251                              ;REPORT RTS NOT SET
 9252  027652                              ERRDF   60,EM60,ERR7
   (4) 027652  104455                                                          TRAP    C$ERDF
   (5) 027654  000074                                                          .WORD   60
   (5) 027656  014204                                                          .WORD   EM60
   (5) 027660  017444                                                          .WORD   ERR7
 9253  027662  004737  006246          3$:     JSR     PC,ENDTRN       ;SET OC, MONITOR OCOR
 9254  027666                          A6:
 9255  027666  004737  003576                JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR TO CLEAN UP
 9256  027672                          ENDTST
   (3) 027672                                                                L10055:
   (3) 027672  104401                                                              TRAP    C$ETST
 9257
 9258
 9259
 9260
 9261
 9262                              ;;*************************************************************************
 9263                              .SBTTL      TEST 26 - TX UNDERRUN SET AND CLEAR TEST - CHAR MODE
 9264                              ;*
 9265                              ;* IN THIS TEST, A TX UNDERRUN ERROR IS FORCED IN EACH OF 2 SITUATIONS,
 9266                              ;* AND THEN CLEARED DIFFERENTLY IN EACH.
 9267                              ;* IN THE FIRST, A MESSAGE IS INITIATED, A 000 CHAR IS SENT, AND THE TX
 9268                              ;* BUFFER IS NOT SERVICED IN RESPONSE TO THE USYRT TX BUFFER EMPTY FLAG,
 9269                              ;* WHICH CAUSES UNRR TO SET IN REG 11. THEN, SOM IS SET TO CLEAR THE ERROR,
 9270                              ;* AND THIS IS VERIFIED.
 9271                              ;* IN THE SECOND SITUATION, A MSG IS INITIATED, A 000 CHAR IS SENT, AND THE TX
 9272                              ;* BUFFER IS NOT SERVICED IN RESPONSE TO THE USYRT TX BUFFER EMPTY FLAG, WHICH
 9273                              ;* AGAIN CAUSES UNRR TO SET. THEN, A MASTER CLEAR IS DONE, AND THE UNRR BIT
 9274                              ;* IS CHECKED TO BE CLEARED.
 9275                              ;;*************************************************************************
 9276  027674                      BGNTST
   (3) 027674                                                                T26::
 9277                              ;-------------------------------------------------------------------------
```

```
 9278                                   ; CAUSE TX UNDERRUN, CHK UNRR = 1; SET SOM, CHK UNRR = 0
 9279                                   ;-------------------------------------------------------------------------
 9280  027674  012737  030232  002362          MOV     #A7,RETADR      ;SET TEST EXIT ADDRESS FOR ERRORS
 9281  027702  004737  005512                  JSR     PC,INITRN       ;DO MASTER CLEAR, LOAD 2 SOM'S
 9282  027706  000226                          SYNCH
 9283  027710  000011                          STRIP!DDCMP
 9284  027712  004737  006074                  JSR     PC,TXCHAR       ;LOAD A 000 CHAR, TX FIRST SYNCH
 9285  027716  000000                          000
 9286  027720  100010                          CHPCHK!8.
 9287  027722  004737  005226                  JSR     PC,STPLU        ;CLOCK THE TRANSMITTER UNTIL 7 BITS OF
 9288  027726  000016                          14.                     ;     THE 000 CHAR HAVE BEEN TRANSMITTED
 9289  027730  012737  000011  002400          MOV     #11,REGNUM      ;SET LU REG NO. = 11
 9290  027736  004737  003644                  JSR     PC,READLU       ;READ REG 11
 9291  027742  132737  000001  002364          BITB    #UNRR,REDBYT    ;CHK FOR UNRR = 0
 9292  027750  001410                          BEQ     6$              ;BR IF UNRR = 0
 9293  027752  004737  004500                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
 9294                                 ;REPORT UNRR NOT CLEARED
 9295  027756                                 ERRDF   16,EM16,ERR7
   (4) 027756  104455                                                                      TRAP    C$ERDF
   (5) 027760  000020                                                                      .WORD   16
   (5) 027762  012576                                                                      .WORD   EM16
   (5) 027764  017444                                                                      .WORD   ERR7
 9296  027766  000137  030232                  JMP     A7              ;SKIP TO END OF TEST
 9297  027772  004737  005226          6$:     JSR     PC,STPLU        ;CLOCK LAST BIT OF 000 CHAR
 9298  027776  000003                          3
 9299  030000  004737  003644                  JSR     PC,READLU       ;READ REG 11
 9300  030004  132737  000001  002364          BITB    #UNRR,REDBYT    ;CHK FOR UNRR = 1
 9301  030012  001010                          BNE     9$              ;BR IF UNRR = 1
 9302  030014  004737  004500                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
 9303                                 ;REPORT UNRR NOT SET
 9304  030020                                 ERRDF   14,EM14,ERR7
   (4) 030020  104455                                                                      TRAP    C$ERDF
   (5) 030022  000016                                                                      .WORD   14
   (5) 030024  012532                                                                      .WORD   EM14
   (5) 030026  017444                                                                      .WORD   ERR7
 9305  030030  000137  030232                  JMP     A7              ;SKIP TO END OF TEST
 9306  030034  012737  000400  002422  9$:     MOV     #TXSOM,TXWORD   ;SET SOM CHAR TO BE WRITTEN
 9307  030042  004737  005146                  JSR     PC,LDTXSI       ;LOAD SOM CHAR INTO TX SILO
 9308  030046  004737  005120                  JSR     PC,WAIT50       ;WAIT FOR SILO DATA TO RIPPLE
 9309  030052  004737  005226                  JSR     PC,STPLU        ;CLOCK LU FOR 2 CYCLES
 9310  030056  000002                          2
 9311  030060  004737  003644                  JSR     PC,READLU       ;READ REG 11
 9312  030064  132737  000001  002364          BITB    #UNRR,REDBYT    ;CHK FOR UNRR = 0
 9313  030072  001410                          BEQ     12$             ;BR IF UNRR = 0
 9314  030074  004737  004500                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
 9315                                 ;REPORT UNRR NOT CLEARED BY SOM
 9316  030100                                 ERRDF   13,EM13,ERR7
   (4) 030100  104455                                                                      TRAP    C$ERDF
   (5) 030102  000015                                                                      .WORD   13
   (5) 030104  012502                                                                      .WORD   EM13
   (5) 030106  017444                                                                      .WORD   ERR7
 9317  030110  000137  030232                  JMP     A7              ;SKIP TO END OF TEST
 9318  030114                         12$:
 9319                                   ;-------------------------------------------------------------------------
 9320                                   ;CAUSE TX UNDERRUN, CHK UNRR = 1; DO MASTER CLR, CHK UNRR = 0
 9321                                   ;-------------------------------------------------------------------------
```

```
 9322  030114  C04737  005512                  JSR     PC,INITRN       ;DO MASTER CLEAR, LOAD 2 SOM'S
 9323  030120  000226                          SYNCH
 9324  030122  000051                          IDLE!STRIP!DDCMP
 9325  030124  004737  006074                  JSR     PC,TXCHAR       ;LOAD A 000 CHAR, TX FIRST SYNCH
 9326  030130  000000                          000
 9327  030132  100010                          CHPCHK!8.
 9328  030134  004737  005226                  JSR     PC,STPLU        ;STEP THE LU UNTIL 000 HAS BEN TRANSMITTED
 9329  030140  000021                          17.
 9330  030142  004737  003644                  JSR     PC,READLU       ;READ REG 11
 9331  030146  132737  000001  002364          BITB    #UNRR,REDBYT    ;CHK FOR UNR = 1
 9332  030154  001010                          BNE     16$             ;BR IF UNRR = 1
 9333  030156  004737  004500                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
 9334                                  ;REPORT UNRR NOT SET
 9335  030162                                  ERRDF   14,EM14,ERR7
   (4) 030162  104455                                                              TRAP    C$ERDF
   (5) 030164  000016                                                              .WORD   14
   (5) 030166  012532                                                              .WORD   EM14
   (5) 030170  017444                                                              .WORD   ERR7
 9336  030172  000137  030232                  JMP     A7              ;SKIP TO END OF TEST
 9337  030176  004737  003576          16$:    JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
 9338  030202  004737  003644                  JSR     PC,READLU       ;READ REG 11
 9339  030206  132737  000001  002364          BITB    #UNRR,REDBYT    ;CHK FOR UNRR = 0
 9340  030214  001406                          BEQ     A7              ;BR IF UNRR = 0
 9341  030216  004737  004500                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
 9342                                  ;REPORT UNRR NOT CLEARED BY OC
 9343  030222                                  ERRDF   15,EM15,ERR7
   (4) 030222  104455                                                              TRAP    C$ERDF
   (5) 030224  000017                                                              .WORD   15
   (5) 030226  012547                                                              .WORD   EM15
   (5) 030230  017444                                                              .WORD   ERR7
 9344  030232  004737  003576          A7:     JSR     PC,MSTCLR       ;ISSUE CLEAN-UP MASTER CLEAR
 9345  030236                                  ENDTST
   (3) 030236                                                                    L10056:
   (3) 030236  104401                                                              TRAP    C$ETST
 9346
 9347
 9348
 9349
 9350
 9351                                  ;;*************************************************************************
 9352                                  .SBTTL      TEST 27 - TRANSMIT CHAR LENGTH TIMING TEST - CHAR MODE, CRC
 9353                                  ;*
 9354                                  ;* THE LINE UNIT IS PLACED IN CHAR MODE (DDCMP) AND A MESSAGE IS INITIATED
 9355                                  ;* WITH AN 8-BIT SYNCH AND A 5-BIT SYNCH CHAR. NEXT, A 000 CHAR IS SENT WITH
 9356                                  ;* EACH OF THE FOLLOWING TX CHAR LENGTHS : 5 BITS, 6 BITS, 7 BITS, 8 BITS.
 9357                                  ;* (FOR EXAMPLE, A 5-BIT CHAR REQUIRES 5 CLOCK CYCLES TO BE TRANSMITTED). TWO
 9358                                  ;* TERMINATING SYNCHS ARE SENT AFTER THE DATA.
 9359                                  ;;*************************************************************************
 9360  030240                          BGNTST
   (3) 030240                                                                    T27::
 9361  030240  012737  030446  002362          MOV     #A8,RETADR      ;SET TEST EXIT ADDRESS FOR ERRORS
 9362  030246  004737  005512                  JSR     PC,INITRN       ;DO MASTER CLR, LOAD 2 SOM'S
 9363  030252  000000                          000
 9364  030254  000041                          IDLE!DDCMP
 9365  030256  012737  000006  002402          MOV     #6,AXNUM        ;SET BYTE NO. = 6 FOR AX3
 9366  030264  012737  000000  002374          MOV     #000,WAX15      ;SET DATA FOR AX3-15 = 0
```

```
 9367  030272  012737  000240  002376          MOV     #TXLEN2!TXLEN0,WAX16 ;SET TX LENGTH = 5 FOR AX3-16
 9368  030300  004737  004264                  JSR     PC,WRITAX       ;LOAD AX3-15,AX3-16
 9369  030304  004737  006074                  JSR     PC,TXCHAR       ;LOAD 5-BIT 000 CHAR, TX 8-BIT SYNCH
 9370  030310  000000                          000
 9371  030312  100010                          CHPCHK!8.
 9372  030314  004737  006074                  JSR     PC,TXCHAR       ;LOAD 6-BIT 000 CHAR, TX 5-BIT SYNCH
 9373  030320  000000                          000
 9374  030322  000005                          5
 9375  030324  012737  000300  002376          MOV     #TXLEN2!TXLEN1,WAX16
 9376  030332  004737  004264                  JSR     PC,WRITAX       ;SET TX CHAR LENGTH = 6
 9377  030336  004737  006074                  JSR     PC,TXCHAR       ;LOAD 7-BIT 000 CHAR, TX 5-BIT 000 CHAR
 9378  030342  000000                          000
 9379  030344  000005                          5
 9380  030346  012737  000340  002376          MOV     #TXLEN2!TXLEN1!TXLEN0,WAX16
 9381  030354  004737  004264                  JSR     PC,WRITAX       ;SET TX CHAR LENGTH = 7
 9382  030360  004737  006074                  JSR     PC,TXCHAR       ;LOAD 8-BIT 000 CHAR, TX 6-BIT 000 CHAR
 9383  030364  000000                          000
 9384  030366  000006                          6
 9385  030370  012737  000000  002376          MOV     #000,WAX16
 9386  030376  004737  004264                  JSR     PC,WRITAX       ;SET TX CHAR LENGTH = 8
 9387  030402  004737  006074                  JSR     PC,TXCHAR       ;LOAD EOM, TX 7-BIT 000 CHAR
 9388  030406  001000                          TXEOM
 9389  030410  000007                          7
 9390  030412  004737  006074                  JSR     PC,TXCHAR       ;LOAD EOM, TX 8-BIT 000 CHAR
 9391  030416  001000                          TXEOM
 9392  030420  000010                          8.
 9393  030422  004737  006074                  JSR     PC,TXCHAR       ;LOAD EOM, TX CRC-16 CHAR
 9394  030426  001000                          TXEOM
 9395  030430  000020                          16.
 9396  030432  004737  006074                  JSR     PC,TXCHAR       ;LOAD EOM, TX FIRST TERMINATING SYNCH
 9397  030436  001000                          TXEOM
 9398  030440  000010                          8.
 9399  030442  004737  006246                  JSR     PC,ENDTRN       ;CLEAR TRANSMITTER
 9400  030446                          A8:
 9401  030446                          ENDTST
  (3)  030446                                                                     L10057:
  (3)  030446  104401                                                                     TRAP    C$ETST
 9402
 9403
 9404
 9405
 9406
 9407                                  ;;*************************************************************************
 9408                                  .SBTTL      TEST 28 - TRANSMIT CHAR LENGTH TIMING TEST - BIT MODE, CRC
 9409                                  ;*
 9410                                  ;* THE LINE UNIT IS PLACED IN BIT MODE AND A MESSAGE IS INITIATED
 9411                                  ;* WITH 2 FLAG CHARS. NEXT, 2 8-BIT 000 CHARS ARE SENT, FOLLOWED BY 000 CHARS
 9412                                  ;* WITH EACH OF THE FOLLOWING TRANSMITTER CHAR LENGTHS:
 9413                                  ;*    1 BIT, 2 BITS, 3 BITS, 4 BITS, 5 BITS, 6 BITS, 7 BITS, AND 8 BITS.
 9414                                  ;* (FOR EXAMPLE, A 5-BIT CHAR REQUIRES 5 CLOCK CYCLES TO BE TRANSMITTED).
 9415                                  ;* TWO TERMINATING FLAGS ARE SENT AFTER THE DATA.
 9416                                  ;;*************************************************************************
 9417  030450                          BGNTST
  (3)  030450                                                                     T28::
 9418  030450  012737  030776  002362          MOV     #A9,RETADR      ;SET TEST EXIT ADDRESS FOR ERRORS
 9419  030456  004737  005512                  JSR     PC,INITRN       ;DO MASTER CLR, LOAD 2 SOM'S
```

```
 9420  030462  000000                          000
 9421  030464  000000                          000
 9422  030466  004737  006074                  JSR     PC,TXCHAR       ;LOAD FIRST 8-BIT 000 CHAR, TX FIRST FLAG
 9423  030472  000000                          000
 9424  030474  100010                          CHPCHK!8.
 9425  030476  004737  006074                  JSR     PC,TXCHAR       ;LOAD 2ND 8-BIT 000 CHAR, TX 2ND FLAG
 9426  030502  000000                          000
 9427  030504  000010                          8.
 9428  030506  004737  006074                  JSR     PC,TXCHAR       ;LOAD 1-BIT 000 CHAR, TX FIRST 8-BIT 000 CHAR
 9429  030512  000000                          000
 9430  030514  000010                          8.
 9431  030516  012737  000006  002402          MOV     #6,AXNUM        ;SET BYTE NO. = 6 FOR AX3
 9432  030524  012737  000000  002374          MOV     #000,WAX15      ;SET DATA FOR AX3-15 = 0
 9433  030532  012737  000040  002376          MOV     #TXLEN0,WAX16   ;SET TX CHAR LENGTH = 1 FOR AX3-16
 9434  030540  004737  004264                  JSR     PC,WRITAX       ;LOAD AX3-15,AX3-16
 9435  030544  004737  006074                  JSR     PC,TXCHAR       ;LOAD 2-BIT 000 CHAR, TX 2ND 8-BIT 000 CHAR
 9436  030550  000000                          000
 9437  030552  000010                          &.
 9438  030554  012737  000100  002376          MOV     #TXLEN1,WAX16
 9439  030562  004737  004264                  JSR     PC,WRITAX       ;SET TX CHAR LENGTH = 2
 9440  030566  004737  006074                  JSR     PC,TXCHAR       ;LOAD 3-BIT 000 CHAR, TX 1-BIT 000 CHAR
 9441  030572  000000                          000
 9442  030574  000001                          1
 9443  030576  012737  000140  002376          MOV     #TXLEN1!TXLEN0,WAX16
 9444  030604  004737  004264                  JSR     PC,WRITAX       ;SET TX CHAR LENGTH = 3
 9445  030610  004737  006074                  JSR     PC,TXCHAR       ;LOAD 4-BIT 000 CHAR, TX 2-BIT 000 CHAR
 9446  030614  000000                          000
 9447  030616  000002                          2
 9448  030620  012737  000200  002376          MOV     #TXLEN2,WAX16
 9449  030626  004737  004264                  JSR     PC,WRITAX       ;SET TX CHAR LENGTH = 4
 9450  030632  004737  006074                  JSR     PC,TXCHAR       ;LOAD 5-BIT 000 CHAR, TX 3-BIT 000 CHAR
 9451  030636  000000                          000
 9452  030640  000003                          3
 9453  030642  012737  000240  002376          MOV     #TXLEN2!TXLEN0,WAX16
 9454  030650  004737  004264                  JSR     PC,WRITAX       ;SET TX CHAR LENGTH = 5
 9455  030654  004737  006074                  JSR     PC,TXCHAR       ;LOAD 6-BIT 000 CHAR, TX 4-BIT 000 CHAR
 9456  030660  000000                          000
 9457  030662  000004                          4
 9458  030664  012737  000300  002376          MOV     #TXLEN2!TXLEN1,WAX16
 9459  030672  004737  004264                  JSR     PC,WRITAX       ;SET TX CHAR LENGTH = 6
 9460  030676  004737  006074                  JSR     PC,TXCHAR       ;LOAD 7-BIT 000 CHAR, TX 5-BIT 000 CHAR
 9461  030702  000000                          000
 9462  030704  000005                          5
 9463  030706  012737  000340  002376          MOV     #TXLEN2!TXLEN1!TXLEN0,WAX16
 9464  030714  004737  004264                  JSR     PC,WRITAX       ;SET TX CHAR LENGTH = 7
 9465  030720  004737  006074                  JSR     PC,TXCHAR       ;LOAD 8-BIT 000 CHAR, TX 6-BIT 000 CHAR
 9466  030724  000000                          000
 9467  030726  000006                          6
 9468  030730  012737  000000  002376          MOV     #000,WAX16
 9469  030736  004737  004264                  JSR     PC,WRITAX       ;SET TX CHAR LENGTH = 8
 9470  030742  004737  006074                  JSR     PC,TXCHAR       ;LOAD EOM, TX 7-BIT 000 CHAR
 9471  030746  001000                          TXEOM
 9472  030750  000007                          7
 9473  030752  004737  006074                  JSR     PC,TXCHAR       ;LOAD EOM, TX 8-BIT 000 CHAR, CRC-CCITT-1 CHAR
 9474  030756  001000                          TXEOM
 9475  030760  000031                          25.
```

```
 9476  030762  004737  006074                  JSR     PC,TXCHAR       ;LOAD EOM, TX FIRST TERMINATING FLAG
 9477  030766  001000                          TXEOM
 9478  030770  000010                          8.
 9479  030772  004737  006246                  JSR     PC,ENDTRN       ;CLEAR TRANSMITTER
 9480  030776                          A9:
 9481  030776                          ENDTST
   (3) 030776                                                                  L10060:
   (3) 030776  104401                                                                  TRAP    C$ETST
 9482
 9483
 9484
 9485
 9486
 9487                          ;;*************************************************************************
 9488                          .SBTTL      TEST 29 - TXDATA BIT TEST - CHAR MODE, NO CRC
 9489                          ;*
 9490                          ;* THE LINE UNIT IS INITIALIZED AND A MSG IS INITIATED (USING STEPLU) WITH CRC-
 9491                          ;* 16 SELECTED IN CHAR MODE. TWO SYNCHS, 000,125,252,377,000, AND 2 TERMINATING
 9492                          ;* SYNCHS ARE THEN SENT. THE PROGRAM CHECKS EACH BIT OF THE TRANSMITTED
 9493                          ;* DATA CHARS, BY MONITORING TXDATA (REG 17) AS THE DATA IS CLOCKED OUT OF
 9494                          ;* THE USYRT TRANSMITTER.
 9495                          ;;*************************************************************************
 9496  031000                  BGNTST
   (3) 031000                                                                  T29::
 9497  031000  004737  005512                  JSR     PC,INITRN       ;DO MASTER CLR, LOAD 2 SOM'S
 9498  031004  000226                          SYNCH
 9499  031006  000011                          STRIP!DDCMP
 9500  031010  012701  003224                  MOV     #MSG1+4,R1      ;GET POINTER TO DATA
 9501  031014  010103                          MOV     R1,R3
 9502  031016  012137  002422          3$:     MOV     (R1)+,TXWORD
 9503  031022  004737  005146                  JSR     PC,LDTXSI       ;LOAD A DATA CHAR INTO TX SILO
 9504  031026  020127  003242                  CMP     R1,#MSG1+18.    ;SEE IF ALL CHARS LOADED YET
 9505  031032  103771                          BLO     3$              ;BR IF NOT YET
 9506  031034  004737  005120                  JSR     PC,WAIT50       ;WAIT FOR SILO TO RIPPLE
 9507  031040  004737  005226                  JSR     PC,STPLU        ;CLOCK LU UNTIL SYNCHS ARE TX'D
 9508  031044  100020                          CHPCHK!16.
 9509  031046  011337  031056          6$:     MOV     (R3),8$         ;GET EXPECTED DATA CHAR
 9510  031052  004737  011150                  JSR     PC,CKTBIT       ;CHECK TXDATA FOR CHAR BITS
 9511  031056  000000          8$:     .WORD   0                       ;EXPECTED CHAR GOES HERE
 9512  031060  062703  000002                  ADD     #2,R3           ;INCR PATTERN POINTER
 9513  031064  020327  003236                  CMP     R3,#MSG1+14.    ;SEE IF ALL CHARS CHECKED YET
 9514  031070  103766                          BLO     6$              ;BR IF NOT YET
 9515  031072  004737  003576          16$:    JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR TO CLEAN UP
 9516  031076                          ENDTST
   (3) 031076                                                                  L10061:
   (3) 031076  104401                                                                  TRAP    C$ETST
 9517
 9518
 9519
 9520
 9521
 9522                          ;;*************************************************************************
 9523                          .SBTTL      TEST 30 - USYRT RECEIVER MSG TEST - CHAR MODE, CRC
 9524                          ;*
 9525                          ;* THE LINE UNIT IS INITIALIZED AND A MESSAGE IS INITIATED (USING STEPLU) WITH
 9526                          ;* 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
                                ;* = 0 AFTER RECEIVER SHUTDOWN.
                                ;;*****************************************************************************
031100                          BGNTST
(3) 031100                                                                              T30::
031100  012737  031442  002362          MOV     #24$,RETADR     ;SET TEST EXIT ADDRESS FOR ERRORS
031106  004737  003576                  JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
031112  004737  010612                  JSR     PC,SETUP        ;PROGRAM THE USYRT
031116  000226                          SYNCH
031120  000013                          STRIP!IERR!DDCMP
031122  000000                          000
031124  000000                          000
031126  012737  000012  002400          MOV     #12,REGNUM      ;SET LU REG NO. = 12
031134  005037  002402                  CLR     AXNUM           ;SET AX BYTE NO. = 0 FOR AX0
031140  112737  000040  002366          MOVB    #LULP,WRIBYT
031146  004737  003722                  JSR     PC,WRITLU       ;SET LULP IN REG 12
031152  012701  003220                  MOV     #MSG1,R1        ;GET POINTER TO MSG DATA TABLE
031156  012137  002422          3$:     MOV     (R1)+,TXWORD    ;GET CHAR TO BE LOADED
031162  004737  005146                  JSR     PC,LDTXSI       ;LOAD CHAR INTO TX SILO
031166  020127  003246                  CMP     R1,#MSG1+22.    ;SEE IF ALL MSG CHARS LOADED YET
031172  103771                          BLO     3$              ;BR IF NOT YET
031174  004737  005120                  JSR     PC,WAIT50       ;ALLOW DATA TO RIPPLE IN SILO
031200  004737  005226                  JSR     PC,STPLU        ;CLOCK LU FOR 40 CYCLES (UNTIL FIRST
031204  000050                          40.                     ;   DATA CHAR IS ABOUT TO BE RECEIVED)
031206  004737  006666                  JSR     PC,IACTIV       ;CHK IACT = 0
031212  000000                          0
031214  004737  005226                  JSR     PC,STPLU        ;CLOCK LU UNTIL 1ST DATA CHAR IS RCV'D
031220  000006                          6
031222  012701  003224                  MOV     #MSG1+4,R1
031226  004737  006666          10$:    JSR     PC,IACTIV       ;CHK IACT = 1
031232  000001                          1
031234  004737  004076                  JSR     PC,READAX       ;READ AX0
031240  023721  002370                  CMP     RAX15,(R1)+     ;COMPARE RCV'D CHAR TO EXPECTED
031244  001415                          BEQ     12$             ;BR IF RCV'D DATA OK
031246  016137  177776  002404          MOV     -2(R1),GOODAT   ;GET EXPECTED DATA
031254  013737  002370  002406          MOV     RAX15,BADDAT    ;GET ACTUAL DATA
031262  004737  004500                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                                ;REPORT INCORRECT DATA CHAR RCV'D
031266                          ERRDF   26,EM26,ERR3
(4) 031266  104455                                                              TRAP    C$ERDF
(5) 031270  000032                                                              .WORD   26
(5) 031272  013043                                                              .WORD   EM26
(5) 031274  015114                                                              .WORD   ERR3
031276  000461                  BR      24$
031300  004737  005226          12$:    JSR     PC,STPLU        ;CLOCK LU 8 CYCLES
031304  000010                          8.
031306  020127  003236                  CMP     R1,#MSG1+14.    ;SEE IF CHECKING HI CRC BYTE YET
031312  103745                          BLO     10$             ;BR IF NOT YET
031314  004737  006666                  JSR     PC,IACTIV       ;CHK IACT = 1
031320  000001                          1
031322  004737  004076                  JSR     PC,READAX       ;READ AX0
031326  123727  002370  000160          CMPB    RAX15,#160      ;CMP RCV'D CHAR TO EXPECTED HI CRC BYTE
031334  001415                          BEQ     16$             ;BR IF HI CRC BYTE RCV'D OK
031336  012737  000160  002404          MOV     #160,GOODAT     ;GET EXPECTED DATA
```

```
 9578  031344  013737  002370  002406  14$:    MOV     RAX15,BADDAT    ;SET ACTUAL DATA
 9579  031352  004737  004500                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
 9580                                  ;REPORT INCORRECT CRC BYTE RCV'D
 9581  031356                                  ERRDF   27,EM27,ERR3
   (4) 031356  104455                                                          TRAP    C$ERDF
   (5) 031360  000033                                                          .WORD   27
   (5) 031362  013075                                                          .WORD   EM27
   (5) 031364  015114                                                          .WORD   ERR3
 9582  031366  000425                          BR      24$
 9583  031370  004737  005226          16$:    JSR     PC,STPLU        ;CLOCK LU FOR 8 CYCLES
 9584  031374  000010                          8.
 9585  031376  004737  006666                  JSR     PC,IACTIV       ;CHK IACT = 1
 9586  031402  000001                          1
 9587  031404  012737  000034  002404          MOV     #034,GOODAT     ;GET EXPECTED LO CRC BYTE
 9588  031412  004737  004076                  JSR     PC,READAX       ;READ AX0
 9589  031416  123727  002370  000034          CMPB    RAX15,#034      ;CMP RCV'D CHAR TO EXPECTED LO CRC BYTE
 9590  031424  001347                          BNE     14$             ;BR IF LO CRC INCORRECT
 9591  031426  004737  005226                  JSR     PC,STPLU        ;CLOCK LU 8 CYCLES
 9592  031432  000010                          8.
 9593  031434  004737  006666                  JSR     PC,IACTIV       ;CHK IACT = 0
 9594  031440  000000                          0
 9595  031442  004737  003576          24$:    JSR     PC,MSTCLR       ;ISSUE CLEAN-UP MASTER CLEAR
 9596  031446                                  ENDTST
   (3) 031446                                                                L10062:
   (3) 031446  104401                                                          TRAP    C$ETST
 9597
 9598
 9599
 9600
 9601
 9602                                  ;;*************************************************************************
 9603                                  .SBTTL      TEST 31 - USYRT RECEIVER MSG TEST - BIT MODE, CRC
 9604                                  ;*
 9605                                  ;* THE LINE UNIT IS INITIALIZED AND A MESSAGE IS INITIATED (USING STEPLU) WITH
 9606                                  ;* LULP (REG 12) SET TO LOOP THE DATA INTERNALLY IN THE USYRT, AND WITH CRC-
 9607                                  ;* CCITT-1. TWO FLAGS, 000,125,252,377,000, AND TWO TERMINATING FLAGS ARE THEN
 9608                                  ;* SENT. THE PROGRAM MONITORS IACT, RSOM, AND THE RCV'D CHARS ARE READ
 9609                                  ;* FROM AX0-15 AND COMPARED TO EXPECTED VALUES. THE PROGRAM THEN CHECKS FOR
 9610                                  ;* IACT = 0, SETS IC TO CLEAR THE RECEIVER, AND CHECKS FOR IACT STILL = 0.
 9611                                  ;;*************************************************************************
 9612  031450                          BGNTST
   (3) 031450                                                                T31::
 9613  031450  012737  032004  002362          MOV     #24$,RETADR     ;SET TEST EXIT ADDRESS FOR ERRORS
 9614  031456  004737  003576                  JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
 9615  031462  004737  010612                  JSR     PC,SETUP        ;PROGRAM THE USYRT
 9616  031466  000000                          000
 9617  031470  000002                          IERR
 9618  031472  000000                          000
 9619  031474  000000                          000
 9620  031476  012737  000012  002400          MOV     #12,REGNUM      ;SET LU REG NO. = 12
 9621  031504  005037  002402                  CLR     AXNUM           ;SET AX BYTE NO. = 0 FOR AX0
 9622  031510  112737  000040  002366          MOVB    #LULP,WRIBYT
 9623  031516  004737  003722                  JSR     PC,WRITLU       ;SET LULP IN REG 12
 9624  031522  012701  003220                  MOV     #MSG1,R1        ;GET POINTER TO MSG DATA TABLE
 9625  031526  012137  002422          3$:     MOV     (R1)+,TXWORD    ;GET CHAR TO BE LOADED
 9626  031532  004737  005146                  JSR     PC,LDTXSI       ;LOAD CHAR INTO TX SILO
```

```
 9627  031536  020127  003242            CMP     R1,#MSG1+18.    ;SEE IF ALL MSG CHARS LOADED YET
 9628  031542  103771                    BLO     3$              ;BR IF NOT YET
 9629  031544  004737  005120            JSR     PC,WAIT50       ;ALLOW DATA TO RIPPLE IN SILO
 9630  031550  004737  005226            JSR     PC,STPLU        ;CLOCK LU FOR 50 CYCLES (UNTIL FIRST
 9631  031554  000062                    50.                     ;   DATA CHAR IS ABOUT TO BE RECEIVED)
 9632  031556  004737  006666            JSR     PC,IACTIV       ;CHK IACT = 0
 9633  031562  000000                    0
 9634  031564  004737  007054            JSR     PC,RSEOM        ;CHK RSOM = 0, REOM = 0
 9635  031570  000000                    0
 9636  031572  004737  005226            JSR     PC,STPLU        ;CLOCK LU UNTIL 1ST DATA CHAR IS RCV'D
 9637  031576  000006                    6
 9638  031600  012701  003224            MOV     #MSG1+4,R1
 9639  031604  020127  003224    5$:     CMP     R1,#MSG1+4      ;SEE IF 1ST CHAR RCV'D
 9640  031610  001007                    BNE     6$              ;BR IF NO
 9641  031612  004737  006666            JSR     PC,IACTIV       ;CHK IACT = 1
 9642  031616  000001                    1
 9643  031620  004737  007054            JSR     PC,RSEOM        ;CHK RSOM = 1, REOM = 0
 9644  031624  000001                    1
 9645  031626  000420                    BR      9$
 9646  031630  020127  003234    6$:     CMP     R1,#MSG1+12.    ;SEE IF LAST CHAR RCV'D
 9647  031634  001007                    BNE     8$              ;BR IF NO
 9648  031636  004737  006666            JSR     PC,IACTIV       ;CHK FOR IACT = 0
 9649  031642  000000                    0
 9650  031644  004737  007054            JSR     PC,RSEOM        ;CHK RSOM = 0, REOM = 0
 9651  031650  000000                    0
 9652  031652  000406                    BR      9$
 9653  031654  004737  006666    8$:     JSR     PC,IACTIV       ;CHK FOR IACT = 1
 9654  031660  000001                    1
 9655  031662  004737  007054            JSR     PC,RSEOM        ;CHK RSOM = 0, REOM = 0
 9656  031666  000000                    0
 9657  031670  004737  004076    9$:     JSR     PC,READAX       ;READ AX0
 9658  031674  023721  002370            CMP     RAX15,(R1)+     ;COMPARE RCV'D CHAR TO EXPECTED
 9659  031700  001415                    BEQ     12$             ;BR IF RCV'D DATA OK
 9660  031702  016137  177776  002404    MOV     -2(R1),GOODAT   ;GET EXPECTED DATA
 9661  031710  013737  002370  002406    MOV     RAX15,BADDAT    ;GET ACTUAL DATA
 9662  031716  004737  004500            JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
 9663                            ;REPORT INCORRECT DATA CHAR RCV'D
 9664  031722                    ERRDF   26,EM26,ERR3
   (4) 031722  104455                                                      TRAP    C$ERDF
   (5) 031724  000032                                                      .WORD   26
   (5) 031726  013043                                                      .WORD   EM26
   (5) 031730  015114                                                      .WORD   ERR3
 9665  031732  000424                    BR      24$
 9666  031734  004737  005226    12$:    JSR     PC,STPLU        ;CLOCK LU 8 CYCLES
 9667  031740  000010                    8.
 9668  031742  020127  003236            CMP     R1,#MSG1+14.    ;SEE IF ALL DATA CHARS CHECKED YET
 9669  031746  103716                    BLO     5$              ;BR IF NOT YET
 9670  031750  004737  006666            JSR     PC,IACTIV       ;CHK IACT = 0
 9671  031754  000000                    0
 9672  031756  004737  007054            JSR     PC,RSEOM        ;CHK RSOM = 0, REOM = 0
 9673  031762  000000                    0
 9674  031764  012737  000200  002366    MOV     #IC,WRIBYT
 9675  031772  004737  003722            JSR     PC,WRITLU       ;SET IC (INPUT CLEAR) IN REG 12
 9676  031776  004737  006666            JSR     PC,IACTIV       ;CHK IACT = 0
 9677  032002  000000                    0
 9678  032004  004737  003576    24$:    JSR     PC,MSTCLR       ;ISSUE CLEAN-UP MASTER CLEAR
```

```
 9679  032010                          ENDTST
  (3)  032010                                                                  L10063:
  (3)  032010  104401                                                                TRAP    C$ETST
 9680
 9681
 9682
 9683
 9684
 9685                                 ;;*************************************************************************************
 9686                                 .SBTTL      TEST 32 - USYRT RECEIVER MSG TEST - CHAR MODE, NO CRC
 9687                                 ;*
 9688                                 ;* THE LINE UNIT IS INITIALIZED AND A MESSAGE IS INITIATED (USING STEPLU) WITH
 9689                                 ;* LULP (REG 12) SET TO LOOP THE DATA INTERNALLY IN THE USYRT, AND WITH NO
 9690                                 ;* ERROR DETECTION. TWO SYNCHS, 000,125,252,377,000, AND TWO SYNCHS ARE
 9691                                 ;* THEN SENT. THE PROGRAM MONITORS IACT, AND THE RECEIVED CHARS ARE READ FROM
 9692                                 ;* AX0-15 AND COMPARED TO EXPECTED VALUES. THE PROGRAM THEN CHECKS FOR IACT
 9693                                 ;* STILL = 0, SETS IC TO CLEAR THE RECEIVER, AND CHECKS FOR IACT = 0.
 9694                                 ;;*************************************************************************************
 9695  032012                         BGNTST
  (3)  032012                                                                  T32::
 9696  032012  012737  032254  002362         MOV     #24$,RETADR     ;SET TEST EXIT ADDRESS FOR ERRORS
 9697  032020  004737  003576                 JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
 9698  032024  004737  010612                 JSR     PC,SETUP        ;PROGRAM THE USYRT
 9699  032030  000226                         SYNCH
 9700  032032  000313                         CRC2!CRC1!STRIP!IERR!DDCMP
 9701  032034  000000                         000
 9702  032036  000000                         000
 9703  032040  012737  000012  002400         MOV     #12,REGNUM      ;SET LU REG NO. = 12
 9704  032046  005037  002402                 CLR     AXNUM           ;SET AX BYTE NO. = 0 FOR AX0
 9705  032052  112737  000040  002366         MOVB    #LULP,WRIBYT
 9706  032060  004737  003722                 JSR     PC,WRITLU       ;SET LULP IN REG 12
 9707  032064  012701  003220                 MOV     #MSG1,R1        ;GET POINTER TO MSG DATA TABLE
 9708  032070  012137  002422         3$:     MOV     (R1)+,TXWORD    ;GET CHAR TO BE LOADED
 9709  032074  004737  005146                 JSR     PC,LDTXSI       ;LOAD CHAR INTO TX SILO
 9710  032100  020127  003242                 CMP     R1,#MSG1+18.    ;SEE IF ALL MSG CHARS LOADED YET
 9711  032104  103771                         BLO     3$              ;BR IF NOT YET
 9712  032106  004737  005120                 JSR     PC,WAIT50       ;ALLOW DATA TO RIPPLE IN SILO
 9713  032112  004737  005226                 JSR     PC,STPLU        ;CLOCK LU FOR 24 CYCLES (UNTIL FIRST
 9714  032116  000030                         24.                     ;   DATA CHAR IS ABOUT TO BE RECEIVED)
 9715  032120  004737  006666                 JSR     PC,IACTIV       ;CHK IACT = 0
 9716  032124  000000                         0
 9717  032126  004737  005226                 JSR     PC,STPLU        ;CLOCK LU UNTIL 1ST DATA CHAR IS RCV'D
 9718  032132  000006                         6
 9719  032134  012701  003224                 MOV     #MSG1+4,R1
 9720  032140  004737  006666         10$:    JSR     PC,IACTIV       ;CHK IACT = 1
 9721  032144  000001                         1
 9722  032146  004737  004076                 JSR     PC,READAX       ;READ AX0
 9723  032152  023721  002370                 CMP     RAX15,(R1)+     ;COMPARE RCV'D CHAR TO EXPECTED
 9724  032156  001415                         BEQ     12$             ;BR IF RCV'D DATA OK
 9725  032160  016137  177776  002404         MOV     -2(R1),GOODAT   ;GET EXPECTED DATA
 9726  032166  013737  002370  002406         MOV     RAX15,BADDAT    ;GET ACTUAL DATA
 9727  032174  004737  004500                 JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
 9728                         ;REPORT INCORRECT DATA CHAR RCV'D
 9729  032200                                 ERRDF   26,EM26,ERR3
  (4)  032200  104455                                                                TRAP    C$ERDF
  (5)  032202  000032                                                                .WORD   26
```

```
  (5)  032204  013043                                                          .WORD   EM26
  (5)  032206  015114                                                          .WORD   ERR3
 9730  032210  000421                    BR      24$
 9731  032212  004737  005226    12$:    JSR     PC,STPLU        ;CLOCK LU 8 CYCLES
 9732  032216  000010                    8.
 9733  032220  020127  003236            CMP     R1,#MSG1+14.    ;SEE IF ALL 5 DATA CHARS RCV'D YET
 9734  032224  103745                    BLO     10$             ;BR IF NOT YET
 9735  032226  004737  006666            JSR     PC,IACTIV       ;CHK FOR IACT STILL = 1
 9736  032232  000001                    1
 9737  032234  012737  000200  002366    MOV     #IC,WRIBYT
 9738  032242  004737  003722            JSR     PC,WRITLU       ;SET IC (INPUT CLEAR) IN REG 12
 9739  032246  004737  006666            JSR     PC,IACTIV       ;CHK IACT = 0
 9740  032252  000000                    0
 9741  032254  004737  003576    24$:    JSR     PC,MSTCLR       ;ISSUE CLEAN-UP MASTER CLEAR
 9742  032260                    ENDTST
  (3)  032260                                                          L10064:
  (3)  032260  104401                                                          TRAP    C$ETST
 9743
 9744
 9745
 9746
 9747
 9748                    ;;*****************************************************************************
 9749                    .SBTTL      TEST 33 - USYRT RECEIVER MSG TEST - BIT MODE, NO CRC
 9750                    ;*
 9751                    ;* THE LINE UNIT IS INITIALIZED AND A MESSAGE IS INITIATED (USING STEPLU) WITH
 9752                    ;* LULP (REG 12) SET TO LOOP THE DATA INTERNALLY IN THE USYRT, AND WITH ERROR
 9753                    ;* DETECTION INHIBITED. TWO FLAGS, 000,125,252,377,000, AND TWO TERMINATING FLAGS
 9754                    ;* ARE THEN SENT. THE PROGRAM MONITORS IACT, RSOM, AND THE RCV'D CHARS ARE
 9755                    ;* READ FROM AX0-15 AND COMPARED TO EXPECTED VALUES. THE PROGRAM THEN CHECKS FOR
 9756                    ;* IACT = 0, SETS IC TO CLEAR THE RECEIVER, AND CHECKS FOR IACT STILL = 0.
 9757                    ;;*****************************************************************************
 9758  032262            BGNTST
  (3)  032262                                                                  T33::
 9759  032262  012737  032616  002362        MOV     #24$,RETADR
 9760  032270  004737  003576                JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
 9761  032274  004737  010612                JSR     PC,SETUP        ;PROGRAM THE USYRT
 9762  032300  000000                        000
 9763  032302  000302                        CRC2!CRC1!IERR
 9764  032304  000000                        000
 9765  032306  000000                        000
 9766  032310  012737  000012  002400        MOV     #12,REGNUM      ;SET LU REG NO. = 12
 9767  032316  005037  002402                CLR     AXNUM           ;SET AX BYTE NO. = 0 FOR AX0
 9768  032322  112737  000040  002366        MOVB    #LULP,WRIBYT
 9769  032330  004737  003722                JSR     PC,WRITLU       ;SET LULP IN REG 12
 9770  032334  012701  003220                MOV     #MSG1,R1        ;GET POINTER TO MSG DATA TABLE
 9771  032340  012137  002422    3$:         MOV     (R1)+,TXWORD    ;GET CHAR TO BE LOADED
 9772  032344  004737  005146                JSR     PC,LDTXSI       ;LOAD CHAR INTO TX SILO
 9773  032350  020127  003242                CMP     R1,#MSG1+18.    ;SEE IF ALL MSG CHARS LOADED YET
 9774  032354  103771                        BLO     3$              ;BR IF NOT YET
 9775  032356  004737  005120                JSR     PC,WAIT50       ;ALLOW DATA TO RIPPLE IN SILO
 9776  032362  004737  005226                JSR     PC,STPLU        ;CLOCK LU FOR 33 CYCLES (UNTIL FIRST
 9777  032366  000041                        33.                     ;   DATA CHAR IS ABOUT TO BE RECEIVED)
 9778  032370  004737  006666                JSR     PC,IACTIV       ;CHK IACT = 0
 9779  032374  000000                        0
 9780  032376  004737  007054                JSR     PC,RSEOM        ;CHK RSOM = 0, RECM = 0
```

```
 9781  032402  000000                          0
 9782  032404  004737  005226                  JSR     PC,STPLU        ;CLOCK LU UNTIL 1ST DATA CHAR IS RCV'D
 9783  032410  000006                          6
 9784  032412  012701  003224                  MOV     #MSG1+4,R1
 9785  032416  020127  003224          5$:     CMP     R1,#MSG1+4      ;SEE IF 1ST CHAR RCV'D
 9786  032422  001007                          BNE     6$              ;BR IF NO
 9787  032424  004737  006666                  JSR     PC,IACTIV       ;CHK IACT = 1
 9788  032430  000001                          1
 9789  032432  004737  007054                  JSR     PC,RSEOM        ;CHK RSOM = 1, REOM = 0
 9790  032436  000001                          1
 9791  032440  000420                          BR      9$
 9792  032442  020127  003234          6$:     CMP     R1,#MSG1+12.    ;SEE IF LAST CHAR RCV'D
 9793  032446  001007                          BNE     8$              ;BR IF NO
 9794  032450  004737  006666                  JSR     PC,IACTIV       ;CHK FOR IACT = 0
 9795  032454  000000                          0
 9796  032456  004737  007054                  JSR     PC,RSEOM        ;CHK RSOM = 0, REOM = 0
 9797  032462  000000                          0
 9798  032464  000406                          BR      9$
 9799  032466  004737  006666          8$:     JSR     PC,IACTIV       ;CHK FOR IACT = 1
 9800  032472  000001                          1
 9801  032474  004737  007054                  JSR     PC,RSEOM        ;CHK RSOM = 0, REOM = 0
 9802  032500  000000                          0
 9803  032502  004737  004076          9$:     JSR     PC,READAX       ;READ AX0
 9804  032506  023721  002370                  CMP     RAX15,(R1)+     ;COMPARE RCV'D CHAR TO EXPECTED
 9805  032512  001415                          BEQ     12$             ;BR IF RCV'D DATA OK
 9806  032514  016137  177776  002404          MOV     -2(R1),GOODAT   ;GET EXPECTED DATA
 9807  032522  013737  002370  002406          MOV     RAX15,BADDAT    ;GET ACTUAL DATA
 9808  032530  004737  004500                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
 9809                          ;REPORT INCORRECT DATA CHAR RCV'D
 9810  032534                                  ERRDF   26,EM26,ERR3
  (4)  032534  104455                                                             TRAP    C$ERDF
  (5)  032536  000032                                                             .WORD   26
  (5)  032540  013043                                                             .WORD   EM26
  (5)  032542  015114                                                             .WORD   ERR3
 9811  032544  000424                          BR      24$
 9812  032546  004737  005226          12$:    JSR     PC,STPLU        ;CLOCK LU 8 CYCLES
 9813  032552  000010                          8.
 9814  032554  020127  003236                  CMP     R1,#MSG1+14.    ;SEE IF ALL DATA CHARS CHECKED YET
 9815  032560  103716                          BLO     5$              ;BR IF NOT YET
 9816  032562  004737  006666                  JSR     PC,IACTIV       ;CHK IACT = 0
 9817  032566  000000                          0
 9818  032570  004737  007054                  JSR     PC,RSEOM        ;CHK RSOM = 0, REOM = 0
 9819  032574  000000                          0
 9820  032576  012737  000200  002366          MOV     #IC,WRIBYT
 9821  032604  004737  003722                  JSR     PC,WRITLU       ;SET IC (INPUT CLEAR) IN REG 12
 9822  032610  004737  006666                  JSR     PC,IACTIV       ;CHK IACT = 0
 9823  032614  000000                          0
 9824  032616  004737  003576          24$:    JSR     PC,MSTCLR       ;ISSUE CLEAN-UP MASTER CLEAR
 9825  032622                          ENDTST
  (3)  032622                                                                    L10065:
  (3)  032622  104401                                                                    TRAP    C$ETST
 9826
 9827
 9828
 9829
 9830
```

```
                        ;;*************************************************************************
                        .SBTTL      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.
                        ;;*************************************************************************
032624                  BGNTST
(3) 032624                                                                      T34::
032624  004737  003576          JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
032630  012737  000014  002400  MOV     #14,REGNUM      ;SET REG NO. = 14
032636  012737  000040  002366  MOV     #DISSI,WRIBYT   ;SET DISSI BIT
032644  004737  003722          JSR     PC,WRITLU
032650  012737  000040  002426  MOV     #DISSI,DISILO   ;SET DISABLE SILO FLAG
032656  012737  000125  002422  MOV     #125,TXWORD     ;LOAD 125 INTO TX SILO
032664  004737  005146          JSR     PC,LDTXSI
032670  012737  000002  002402  MOV     #2,AXNUM        ;SET REG NO. FOR AX1
032676  004737  004076          JSR     PC,READAX       ;READ AX1-15, AX1-16
032702  123727  002370  000000  CMPB    RAX15,#000      ;CHECK FOR AX1-15 UNCHANGED
032710  001414                  BEQ     3$              ;BR IF UNCHANGED
032712  012737  000000  002404  MOV     #000,GOODAT     ;GET EXPECTED DATA
032720  013737  002370  002406  MOV     RAX15,BADDAT    ;GET ACTUAL DATA
032726  004737  004500          JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                        ;REPORT REG MISCOMPARE
032732                  ERRDF   3,EM3,ERR3
(4) 032732  104455                                                              TRAP    C$ERDF
(5) 032734  000003                                                              .WORD   3
(5) 032736  012174                                                              .WORD   EM3
(5) 032740  015114                                                              .WORD   ERR3
032742  005037  002426  3$:     CLR     DISILO          ;CLEAR DISABLE SILO FLAG
032746  004737  003576          JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR TO CLEAN UP
032752                  ENDTST
(3) 032752                                                                      L10066:
(3) 032752  104401                                                              TRAP    C$ETST


                        ;;*************************************************************************
                        .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.
                        ;;*************************************************************************
032754                  BGNTST
(3) 032754                                                                      T35::
032754  012737  033654  002362          MOV     #18$,RETADR     ;SET TEST EXIT ADDRESS FOR ERRORS
032762  004737  005512          JSR     PC,INITRN       ;FIND OUT WHICH USYRT CHIP
032766  000000                  0
032770  000000                  0
```

```
 9879  032772  004737  003576              JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
 9880  032776  004737  010612              JSR     PC,SETUP        ;PROGRAM THE USYRT
 9881  033002  000000                      000
 9882  033004  000302                      CRC2!CRC1!IERR
 9883  033006  000000                      000
 9884  033010  000000                      000
 9885  033012  012737  000014  002400      MOV     #14,REGNUM      ;SET REG NO. = 14
 9886  033020  012737  000140  002366      MOV     #TXEN!DISSI,WRIBYT
 9887  033026  004737  003722              JSR     PC,WRITLU       ;SET TXEN AND DISSI IN REG 14
 9888  033032  012737  000140  002426      MOV     #TXEN!DISSI,DISILO      ;SET DISABLE SILO FLAG
 9889  033040  012737  000012  002400      MOV     #12,REGNUM      ;SET LU REG NO. = 12
 9890  033046  112737  000040  002366      MOVB    #LULP,WRIBYT
 9891  033054  004737  003722              JSR     PC,WRITLU       ;SET LULP IN REG 12
 9892  033060  012701  003220              MOV     #MSG1,R1        ;GET POINTER TO MSG
 9893  033064  004737  004634              JSR     PC,OSIRDY       ;CHK ORDY = 1
 9894  033070  000001                      1
 9895  033072  012737  000002  002402      MOV     #2,AXNUM        ;SET AX BYTE NO. FOR AX1
 9896  033100  112137  002374              MOVB    (R1)+,WAX15     ;GET A CHAR
 9897  033104  112137  002376              MOVB    (R1)+,WAX16
 9898  033110  004737  004264              JSR     PC,WRITAX       ;LOAD CHAR INTO USYRT TX BUFFER
 9899  033114  004737  004634              JSR     PC,OSIRDY       ;CHK ORDY = 0
 9900  033120  000000                      0
 9901  033122  004737  005324              JSR     PC,OACTIV       ;CHK OACT = 0
 9902  033126  000000                      0
 9903  033130  004737  005226              JSR     PC,STPLU        ;CLOCK LU FOR 3 CYCLES
 9904  033134  000003                      3
 9905  033136  004737  005324              JSR     PC,OACTIV       ;CHK OACT = 1
 9906  033142  000001                      1
 9907  033144  012703  000004              MOV     #4,R3           ;INIT COUNTER
 9908  033150  112137  002374      4$:     MOVB    (R1)+,WAX15     ;GET ANOTHER CHAR
 9909  033154  112137  002376              MOVB    (R1)+,WAX16
 9910  033160  020327  000001              CMP     R3,#1           ;SEE IF LOADING LAST DATA CHAR YET
 9911  033164  001006                      BNE     5$              ;BR IF NOT
 9912  033166  005737  002430              TST     CHPTYP          ;SEE IF SIG USYRT
 9913  033172  001403                      BEQ     5$              ;BR IF YES
 9914  033174  112737  000002  002376      MOVB    #TEOM,WAX16     ;SET TEOM WITH LAST DATA CHAR
 9915  033202  004737  004634      5$:     JSR     PC,OSIRDY       ;CHK ORDY = 1
 9916  033206  000001                      1
 9917  033210  004737  004264              JSR     PC,WRITAX       ;LOAD ANOTHER CHAR INTO USYRT TX BUFFER
 9918  033214  004737  004634              JSR     PC,OSIRDY       ;CHK ORDY = 0
 9919  033220  000000                      0
 9920  033222  004737  006666              JSR     PC,IACTIV       ;CHK IACT = 0
 9921  033226  000000                      0
 9922  033230  004737  007054              JSR     PC,RSEOM        ;CHK RSOM = 0, REOM = 0
 9923  033234  000000                      0
 9924  033236  004737  005226              JSR     PC,STPLU        ;CLOCK LU FOR 8 CYCLES
 9925  033242  000010                      8.
 9926  033244  004737  005324              JSR     PC,OACTIV       ;CHK OACT = 1
 9927  033250  000001                      1
 9928  033252  004737  004634              JSR     PC,OSIRDY       ;CHK ORDY = 1
 9929  033256  000001                      1
 9930  033260  005303                      DEC     R3              ;DECR COUNTER
 9931  033262  001332                      BNE     4$              ;BR IF NOT DONE YET
 9932  033264  004737  006402              JSR     PC,ISIRDY       ;CHK IRDY = 0
 9933  033270  000000                      0
 9934  033272  005737  002430              TST     CHPTYP          ;SEE IF SIG USYRT
```

```
 9935  033276  001007                          BNE     11$             ;BR IF NOT
 9936  033300  105037  002374                  CLRB    WAX15
 9937  033304  112737  000002  002376          MOVB    #TEOM,WAX16     ;LOAD EOM CHAR
 9938  033312  004737  004264                  JSR     PC,WRITAX       ;LOAD ANOTHER CHAR INTO USYRT TX BUFFER
 9939  033316  004737  005226          11$:    JSR     PC,STPLU        ;CLOCK LU FOR 3 CYCLES
 9940  033322  000003                          3
 9941  033324  004737  006402                  JSR     PC,ISIRDY       ;CHK IRDY = 1
 9942  033330  000002                          2
 9943  033332  004737  005324                  JSR     PC,OACTIV       ;CHK OACT = 1
 9944  033336  000001                          1
 9945  033340  004737  006666                  JSR     PC,IACTIV       ;CHK IACT = 1
 9946  033344  000001                          1
 9947  033346  004737  007054                  JSR     PC,RSEOM        ;CHK RSOM = 1, REOM = 0
 9948  033352  000001                          1
 9949  033354  004737  006402                  JSR     PC,ISIRDY       ;CHK IRDY = 0
 9950  033360  000000                          0
 9951  033362  012737  000000  002402          MOV     #0,AXNUM        ;SET AX BYTE NO. FOR AX0
 9952  033370  123727  002370  000000          CMPB    RAX15,#000      ;COMPARE RCV'D CHAR TO 000
 9953  033376  001415                          BEQ     9$              ;BR IF MATCH
 9954  033400  012737  000000  002404          MOV     #0,GOODAT       ;SET EXPECTED DATA
 9955  033406  012737  002370  002406  6$:     MOV     #RAX15,BADDAT   ;SET ACTUAL DATA
 9956  033414  004737  004500                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
 9957                                  ;REPORT INCORRECT DATA CHAR RCV'D
 9958  033420                                  ERRDF   26,EM26,ERR3
  (4)  033420  104455                                                                     TRAP    C$ERDF
  (5)  033422  000032                                                                     .WORD   26
  (5)  033424  013043                                                                     .WORD   EM26
  (5)  033426  015114                                                                     .WORD   ERR3
 9959  033430  000511                          BR      18$
 9960  033432  004737  005226          9$:     JSR     PC,STPLU        ;CLOCK LU FOR 8 CYCLES
 9961  033436  000010                          8.
 9962  033440  004737  006402                  JSR     PC,ISIRDY       ;CHK IRDY = 1
 9963  033444  000002                          2
 9964  033446  004737  005324                  JSR     PC,OACTIV       ;CHK OACT = 1
 9965  033452  000001                          1
 9966  033454  004737  006666                  JSR     PC,IACTIV       ;CHK IACT = 1
 9967  033460  000001                          1
 9968  033462  004737  007054                  JSR     PC,RSEOM        ;CHK RSOM = 1, REOM = 0
 9969  033466  000000                          0
 9970  033470  004737  006402                  JSR     PC,ISIRDY       ;CHK IRDY = 0
 9971  033474  000000                          0
 9972  033476  123727  002370  000125          CMPB    RAX15,#125      ;COMPARE 2ND RCV'D CHAR TO 125
 9973  033504  001404                          BEQ     12$             ;BR IF MATCH
 9974  033506  012737  000125  002404          MOV     #125,GOODAT     ;SET EXPECTED DATA
 9975  033514  000734                          BR      6$              ;BR TO REPORT ERROR
 9976  033516  004737  005226          12$:    JSR     PC,STPLU        ;CLOCK LU FOR 8 CYCLES
 9977  033522  000010                          8.
 9978  033524  004737  006402                  JSR     PC,ISIRDY       ;CHK IRDY = 1
 9979  033530  000002                          2
 9980  033532  004737  005324                  JSR     PC,OACTIV       ;CHK OACT = 1
 9981  033536  000001                          1
 9982  033540  004737  006666                  JSR     PC,IACTIV       ;CHK IACT = 0
 9983  033544  000000                          0
 9984  033546  004737  007054                  JSR     PC,RSEOM        ;CHK RSOM = 0, REOM = 1
 9985  033552  000002                          2
 9986  033554  004737  006402                  JSR     PC,ISIRDY       ;CHK IRDY = 0
```

```
 9987  033560  000000                          0
 9988  033562  123727  002370  000252          CMPB    RAX15,#252      ;COMPARE 3RD RCV'D CHAR TO 252
 9989  033570  001404                          BEQ     14$             ;BR IF MATCH
 9990  033572  012737  000252  002404          MOV     #252,GOODAT     ;SET EXPECTED DATA
 9991  033600  000702                          BR      6$              ;BR TO REPORT ERROR
 9992  033602  012737  000014  002400  14$:     MOV     #14,REGNUM      ;SET REG NO. = 14
 9993  033610  012737  000040  002366          MOV     #DISSI,WRIBYT
 9994  033616  004737  003722                  JSR     PC,WRITLU       ;CLEAR TX ENABLE
 9995  033622  012737  000011  002400          MOV     #11,REGNUM      ;SET REG NO. = 11
 9996  033630  012737  000200  002366          MOV     #OC,WRIBYT
 9997  033636  004737  003722                  JSR     PC,WRITLU       ;SET OC TO SHUT DOWN TRANSMITTER
 9998  033642  004737  005120                  JSR     PC,WAIT50       ;WAIT FOR SHUTDOWN
 9999  033646  004737  005324                  JSR     PC,OACTIV       ;CHK FOR OACT = 0
10000  033652  000000                          0
10001  033654  005037  002426          18$:    CLR     DISILO          ;CLEAR DISABLE SILO FLAG
10002  033660  004737  003576                  JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR TO CLEAN UP
10003  033664                          ENDTST
  (3)  033664                                                                  L10067:
  (3)  033664  104401                                                                  TRAP    C$ETST
10004
10005
10006
10007
10008
10009                          ;;*************************************************************************
10010                          .SBTTL      TEST 36 - RECEIVER BUFFER TEST - CHAR MODE, CRC
10011                          ;*
10012                          ;* FIRST, A MASTER CLEAR IS DONE AND THE PROGRAM CHECKS FOR ICIR = 1 AND IRDY
10013                          ;* = 0. THEN, 2 SOM CHARS ARE LOADED AND CLOCKED INTO THE USYRT, AND 64
10014                          ;* BYTES OF A 256-BYTE BINARY COUNT DATA PATTERN (000-377) ARE LOADED INTO
10015                          ;* THE TX SILO.
10016                          ;* THE LINE UNIT IS THEN CLOCKED UNTIL IRDY = 1, AND THE PROGRAM CHECKS FOR
10017                          ;* THIS TO OCCUR WITHIN 40-43 CYCLES. THE PROGRAM READS THE RCV SILO, CHECKS THE
10018                          ;* CHAR FOR 000, AND CHECKS FOR IRDY = 0 AGAIN.
10019                          ;* THE LINE UNIT IS THEN CLOCKED IN GROUPS OF 8 CYCLES, AND AFTER EACH, THE
10020                          ;* PROGRAM CHECKS FOR ICIR = 1, IRDY = 1, UNTIL THE 64TH GROUP, AFTER WHICH
10021                          ;* IT CHECKS FOR ICIR = 0, IRDY = 1. THE SECOND DATA CHAR IS READ FROM THE
10022                          ;* RECEIVER SILO AND COMPARED TO 001. THEN, THE PROGRAM CHECKS FOR ICIR = 1,
10023                          ;* IRDY = 1 AGAIN.
10024                          ;* THE REST OF THE BINARY COUNT DATA BYTES ARE CYCLED 8 CLOCKS AND READ AND
10025                          ;* COMPARED A BYTE AT A TIME.
10026                          ;;*************************************************************************
10027  033666                  BGNTST
  (3)  033666                                                                  T36::
10028  033666  012737  034142  002362                  MOV     #A10,RETADR     ;SET TEST EXIT ADDRESS FOR ERRORS
10029                          ;-------------------------------------------------------------------------
10030                          ; DO MASTER CLR, CHK FOR ICIR = 1, IRDY = 0
10031                          ;-------------------------------------------------------------------------
10032  033674  004737  003576                  JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
10033  033700  004737  006402                  JSR     PC,ISIRDY       ;CHK ICIR = 1, IRDY = 0
10034  033704  000001                          1
10035                          ;-------------------------------------------------------------------------
10036                          ; LOAD AND CLOCK 2 SOM'S, LOAD 64 BYTES OF BINARY COUNT PATTERN INTO TX SILO,
10037                          ; CLOCK LINE UNIT, CHK FOR IRDY = 1 WITHIN 40-43 CYCLES
10038                          ;-------------------------------------------------------------------------
10039  033706  004737  005512                  JSR     PC,INITRN       ;LOAD 2 SOM'S, CLOCK THEM INTO USYRT
```

```
10040  033712  000226                        SYNCH
10041  033714  000011                        STRIP!DDCMP
10042  033716  005003                        CLR     R3              ;INIT BINARY COUNT DATA FOR WRITING
10043  033720  010337  002422          2$:   MOV     R3,TXWORD
10044  033724  004737  005146                JSR     PC,LDTXSI       ;LOAD A DATA BYTE INTO TX SILO
10045  033730  005203                        INC     R3              ;INCR DATA
10046  033732  020327  000100                CMP     R3,#64.         ;SEE IF 64 BYTES LOADED YET
10047  033736  002770                        BLT     2$              ;BR IF NOT YET
10048  033740  004737  007406                JSR     PC,RCV1ST       ;RECEIVE AND TIME FIRST CHARACTER
10049  033744  000050                        40.
10050                                  ;-----------------------------------------------------------------
10051                                  ; READ RCV SILO, COMPARE FIRST CHAR TO 000, CHK FOR ICIR = 1, IRDY = 0
10052                                  ;-----------------------------------------------------------------
10053  033746  005004                  9$:   CLR     R4              ;INIT PATTERN FOR READING
10054  033750  004737  007722                JSR     PC,CKDATA       ;READ RCV SILO, COMPARE DATA
10055  033754  000000                        0                       ;EXPECTED DATA = 000
10056  033756  000000                        0                       ;DON'T CLOCK LINE UNIT
10057  033760  005204                  16$:  INC     R4              ;INCR DATA FOR READING
10058  033762  004737  006402                JSR     PC,ISIRDY       ;CHK FOR ICIR = 1, IRDY = 0
10059  033766  000001                        1
10060                                  ;-----------------------------------------------------------------
10061                                  ; CLOCK 63 CHARS INTO RCV SILO, CHK ICIR = 1, IRDY = 1
10062                                  ;-----------------------------------------------------------------
10063  033770  004737  005226          18$:  JSR     PC,STPLU        ;CLOCK LU FOR 8 CYCLES
10064  033774  000010                        8.
10065  033776  010337  002422                MOV     R3,TXWORD
10066  034002  004737  005146                JSR     PC,LDTXSI       ;LOAD ANOTHER WORD INTO TX SILO
10067  034006  005203                        INC     R3              ;INCR PATTERN FOR WRITING
10068  034010  004737  006402                JSR     PC,ISIRDY       ;CHK ICIR = 1, IRDY = 1
10069  034014  000003                        3
10070  034016  020327  000177                CMP     R3,#127.        ;SEE IF 63 MORE CHARS CLOCKED YET
10071  034022  002762                        BLT     18$             ;BR IF NOT YET
10072                                  ;-----------------------------------------------------------------
10073                                  ; CLOCK 1 MORE CHAR INTO RCV SILO, CHK ICIR = 0, IRDY = 1
10074                                  ;-----------------------------------------------------------------
10075  034024  004737  005226                JSR     PC,STPLU        ;CLOCK LU FOR 8 CYCLES
10076  034030  000010                        8.
10077  034032  004737  006402                JSR     PC,ISIRDY       ;CHK ICIR = 0, IRDY = 1
10078  034036  000002                        2
10079                                  ;-----------------------------------------------------------------
10080                                  ;READ, COMPARE, CLOCK REST OF DATA CHARS
10081                                  ;-----------------------------------------------------------------
10082  034040  010437  034050          20$:  MOV     R4,21$          ;SET EXPECTED DATA
10083  034044  004737  007722                JSR     PC,CKDATA       ;READ AND COMPARE DATA
10084  034050  000000                  21$:  0                       ;EXPECTED SILO ENTRY GOES HERE
10085  034052  000000                        0                       ;DON'T CLOCK LINE UNIT
10086  034054  005204                  22$:  INC     R4              ;INCR DATA PATTERN FOR READS
10087  034056  020427  000400                CMP     R4,#400         ;SEE IF ALL DONE READING YET
10088  034062  001427                        BEQ     32$             ;BR IF DONE READING
10089  034064  004737  006402                JSR     PC,ISIRDY       ;CHK ICIR = 1, IRDY = 1
10090  034070  000003                        3
10091  034072  004737  005226                JSR     PC,STPLU        ;CLOCK LU FOR 8 CYCLES
10092  034076  000010                        8.
10093  034100  020327  000377                CMP     R3,#377         ;SEE IF ALL CHARS LOADED INTO TX SILO YET
10094  034104  003007                        BGT     24$             ;BR IF YES
10095  034106  010337  002422                MOV     R3,TXWORD
```

```
10096  034112  004737  005146                  JSR     PC,LDTXSI       ;LOAD ANOTHER CHAR INTO TX SILO
10097  034116  005203                          INC     R3              ;INCR DATA PATTERN FOR WRITING
10098  034120  000137  034040                  JMP     20$
10099  034124  012737  001000  002422  24$:    MOV     #TXEOM,TXWORD
10100  034132  004737  005146                  JSR     PC,LDTXSI       ;LOAD EOM INTO TX SILO
10101  034136  000137  034040                  JMP     20$
10102  034142                          32$:
10103  034142  004737  003576          A10:    JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR TO CLEAN UP
10104  034146                          ENDTST
  (3)  034146                                                                  L10070:
  (3)  034146  104401                                                                  TRAP    C$ETST
10105
10106
10107
10108
10109
10110                                   ;;*************************************************************************
10111                                   .SBTTL      TEST 37 - RECEIVER CHAR LENGTH TIMING TEST - CHAR MODE, NO CRC
10112                                   ;*
10113                                   ;* THE LINE UNIT IS PLACED IN CHAR MODE, WITH NO ERROR DETECTION, AND A MSG IS
10114                                   ;* INITIATED WITH 2 SYNCH CHARS. NEXT, FIFTEEN 000 CHARS ARE LOADED INTO THE
10115                                   ;* TRANSMITTER SILO. THE LINE UNIT IS THEN CLOCKED USING STEPLU WITH LULOOP
10116                                   ;* SET, WHILE THE RECEIVER CHAR LENGTH IS SET TO THE FOLLOWING VALUES : 5,6,7,8.
10117                                   ;* FOR EACH RCV CHAR LENGTH, THE PROGRAM CHECKS TO MAKE SURE THET USYRT RECEIVER
10118                                   ;* FLAGS OCCUR THE PROPER NO. OF CYCLES APART, FOR EACH RCV CHAR LENGTH.
10119                                   ;* (FOR EXAMPLE A 5-BIT CHAR TAKES 5 CLOCK CYCLES TO BE RECEIVED). A MASTER
10120                                   ;* CL AR IS THEN DONE TO TERMINATE THE OPERATION.
10121                                   ;;*** <*************************************************************************
10122  034150                          BGNTST
  (3)  034150                                                                  T37::
10123  034150  012737  034342  002362          MOV     #24$,RETADR     ;SET TEST EXIT ADRS FOR ERRORS
10124  034156  004737  005512                  JSR     PC,INITRN       ;DO MASTER CLR, LOAD 2 SOM'S
10125  034162  000000                          000
10126  034164  000341                          CRC2!CRC1!IDLE!DDCMP
10127  034166  012701  000017                  MOV     #15.,R1         ;INIT COUNTER
10128  034172  005037  002422                  CLR     TXWORD
10129  034176  004737  005146          3$:     JSR     PC,LDTXSI       ;LOAD A 000 CHAR INTO TX SILO
10130  034202  005301                          DEC     R1              ;DECR COUNTER
10131  034204  001374                          BNE     3$              ;BR IF NOT DONE LOADING YET
10132  034206  004737  005120                  JSR     PC,WAIT50       ;WAIT FOR SILO TO RIPPLE
10133  034212  012737  000006  002402          MOV     #6,AXNUM        ;SET BYTE NO. = 6 FOR AX3
10134  034220  012737  000000  002374          MOV     #000,WAX15      ;SET DATA FOR AX3-15 = 0
10135  034226  012737  000005  002376          MOV     #RXLEN2!RXLEN0,WAX16 ;SET RCV LEN = 5
10136  034234  004737  004264                  JSR     PC,WRITAX       ;LOAD AX3
10137  034240  004737  005226                  JSR     PC,STPLU        ;CLK LU UNTIL TX'ING 1ST DATA CHAR
10138  034244  100012                          CHPCHK!10.
10139  034246  012737  000006  002376          MOV     #RXLEN2!RXLEN1,WAX16 ;SET RCV LEN = 6
10140  034254  004737  004264                  JSR     PC,WRITAX       ;LOAD AX3
10141  034260  004737  007406                  JSR     PC,RCV1ST       ;CLOCK 5-BIT DATA CHAR
10142  034264  000005                          5
10143  034266  012737  000007  002376          MOV     #RXLEN2!RXLEN1!RXLEN0,WAX16 ;SET RCV LEN = 7
10144  034274  004737  004264                  JSR     PC,WRITAX       ;LOAD AX3
10145  034300  004737  011046                  JSR     PC,RXCHAR       ;RCV 5-BIT DATA CHAR, CLK 6-BIT
10146  034304  000006                          6
10147  034306  012737  000000  002376          MOV     #0,WAX16        ;SET RCV LEN = 8
10148  034314  004737  004264                  JSR     PC,WRITAX       ;LOAD AX3
```

```
10149  034320  004737  011046                  JSR     PC,RXCHAR       ;RCV 6-BIT DATA CHAR, CLK 7-BIT
10150  034324  000007                          7
10151  034326  004737  011046                  JSR     PC,RXCHAR       ;RCV 7-BIT DATA CHAR, CLK 8-BIT
10152  034332  000010                          8.
10153  034334  004737  011046                  JSR     PC,RXCHAR       ;RCV 8-BIT DATA CHAR
10154  034340  000010                          8.
10155  034342  004737  003576          24$:    JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR TO CLEAN UP
10156  034346                          ENDTST
  (3)  034346                                                                  L10071:
  (3)  034346  104401                                                                  TRAP    C$ETST
10157
10158
10159
10160
10161
10162                                   ;;*************************************************************************
10163                                   .SBTTL      TEST 38 - RECEIVER CHAR LENGTH TIMING TEST - BIT MODE, NO CRC
10164                                   ;*
10165                                   ;* THE LINE UNIT IS PLACED IN BIT MODE WITH NO ERROR DETECTION, AND A MESSAGE IS
10166                                   ;* INITIATED  WITH 2 FLAG CHARS. NEXT, FIFTEEN 000 CHARS ARE LOADED INTO THE
10167                                   ;* TRANSMITTER SILO. THE LINE UNIT IS THEN CLOCKED USING STEPLU WITH LULOOP
10168                                   ;* SET, WHILE THE RCV CHAR LENGTH IS SET TO THE FOLLOWING VALUES : 8,8,8,7,6,5,
10169                                   ;* 4,3,2,1. FOR EACH RCV CHAR LENGTH, THE PROGRAM CHECKS TO MAKE SURE THAT THE
10170                                   ;* USYRT RECEIVER FLAGS OCCUR THE PROPER NO. OF CYCLES APART, FOR EACH RCV
10171                                   ;* CHAR LENGTH. (FOR EXAMPLE, A 5 BIT CHAR TAKES 5 CLOCK CYCLES TO BE RECEIVED).
10172                                   ;* A MASTER CLEAR IS THEN DONE TO TERMINATE THE OPERATION.
10173                                   ;;*************************************************************************
10174  034350                           BGNTST
  (3)  034350                                                                  T38::
10175  034350  012737  034642  002362          MOV     #24$,RETADR     ;SET TEST EXIT ADRS FOR ERRORS
10176  034356  004737  005512                  JSR     PC,INITRN       ;DO MASTER CLR, LOAD 2 SOM'S
10177  034362  000000                          000
10178  034364  000300                          CRC2!CRC1
10179  034366  012701  000017                  MOV     #15.,R1         ;INIT COUNTER
10180  034372  005037  002422                  CLR     TXWORD
10181  034376  004737  005146          3$:     JSR     PC,LDTXSI       ;LOAD A 000 CHAR INTO TX SILO
10182  034402  005301                          DEC     R1              ;DECR COUNTER
10183  034404  001374                          BNE     3$              ;BR IF NOT DONE LOADING YET
10184  034406  004737  005120                  JSR     PC,WAIT50       ;WAIT FOR SILO TO RIPPLE
10185  034412  012737  000006  002402          MOV     #6,AXNUM        ;SET BYTE NO. = 6 FOR AX3
10186  034420  012737  000000  002374          MOV     #000,WAX15      ;SET DATA FOR AX3-15 = 0
10187  034426  004737  007406                  JSR     PC,RCV1ST       ;CLOCK FIRST 8-BIT DATA CHAR
10188  034432  000040                          32.
10189  034434  012737  000000  002376          MOV     #0,WAX16        ;SET RCV LEN = 8
10190  034442  004737  004264                  JSR     PC,WRITAX       ;LOAD AX3
10191  034446  004737  011046                  JSR     PC,RXCHAR       ;RCV FIRST 8-BIT DATA CHAR, CLK SECOND 8-BIT
10192  034452  000010                          8.
10193  034454  012737  000007  002376          MOV     #RXLEN2!RXLEN1!RXLEN0,WAX16 ;SET RCV LEN = 7
10194  034462  004737  004264                  JSR     PC,WRITAX       ;LOAD AX3
10195  034466  004737  011046                  JSR     PC,RXCHAR       ;RCV SECOND 8-BIT DATA CHAR, CLK 3RD 8-BIT
10196  034472  000010                          8.
10197  034474  012737  000006  002376          MOV     #RXLEN2!RXLEN1,WAX16    ;SET RCV LEN = 6
10198  034502  004737  004264                  JSR     PC,WRITAX       ;LOAD AX3
10199  034506  004737  011046                  JSR     PC,RXCHAR       ;RCV 3RD 8-BIT DATA CHAR, CLK 7-BIT
10200  034512  000007                          7
10201  034514  012737  000005  002376          MOV     #RXLEN2!RXLEN0,WAX16    ;SET RCV LEN = 5
```

```
10202  034522  004737  004264                    JSR     PC,WRITAX       ;LOAD AX3
10203  034526  004737  011046                    JSR     PC,RXCHAR       ;RCV 7-BIT DATA CHAR, CLK 6-BIT
10204  034532  000006                            6
10205  034534  012737  000004  002376            MOV     #RXLEN2,WAX16   ;SET RCV LEN = 4
10206  034542  004737  004264                    JSR     PC,WRITAX       ;LOAD AX3
10207  034546  004737  011046                    JSR     PC,RXCHAR       ;RCV 6-BIT DATA CHAR, CLK 5-BIT
10208  034552  000005                            5
10209  034554  012737  000003  002376            MOV     #RXLEN1!RXLEN0,WAX16    ;SET RCV LEN = 3
10210  034562  004737  004264                    JSR     PC,WRITAX       ;LOAD AX3
10211  034566  004737  011046                    JSR     PC,RXCHAR       ;RCV 5-BIT DATA CHAR, CLR 4-BIT
10212  034572  000004                            4
10213  034574  012737  000002  002376            MOV     #RXLEN1,WAX16   ;SET RCV LEN = 2
10214  034602  004737  004264                    JSR     PC,WRITAX       ;LOAD AX3
10215  034606  004737  011046                    JSR     PC,RXCHAR       ;RCV 4-BIT DATA CHAR, CLK 3-BIT
10216  034612  000003                            3
10217  034614  012737  000001  002376            MOV     #RXLEN0,WAX16   ;SET RCV LEN = 1
10218  034622  004737  004264                    JSR     PC,WRITAX       ;LOAD AX3
10219  034626  004737  011046                    JSR     PC,RXCHAR       ;RCV 3-BIT DATA CHAR, CLK 2-BIT
10220  034632  000002                            2
10221  034634  004737  011046                    JSR     PC,RXCHAR       ;RCV 2-BIT DATA CHAR, CLK 1-BIT
10222  034640  000001                            1
10223  034642  004737  003576          24$:      JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR TO CLEAN UP
10224  034646                          ENDTST
  (3)  034646                                                                           L10072:
  (3)  034646  104401                                                                           TRAP    C$ETST
10225
10226
10227
10228
10229
10230                                   ;;*************************************************************************
10231                                   .SBTTL      TEST 39 - TRANSMITTER UNDERRUN ERROR, IDLE MARKING, CHAR MODE,NO CRC
10232                                   ;*
10233                                   ;* THE LINE UNIT IS PLACED IN CHAR MODE, AND THE IDLE BIT IS SET. THEN, A
10234                                   ;* MSG IS INITIATED, A 000 CHAR IS SENT, AND THE TX BUFFER IS NOT SERVICED
10235                                   ;* IN RESPONSE TO THE USYRT TX BUFFER EMPTY FLAG, WHICH CAUSES A TX UNDERRUN
10236                                   ;* ERROR. THEN, THE RECEIVER IS CLOCKED AND CHECKED FOR TWO 377 CHARS TO BE
10237                                   ;* RECEIVED (LINE MARKING) BEFORE SHUTTING DOWN WITH A MASTER CLEAR.
10238                                   ;;*************************************************************************
10239  034650                           BGNTST
  (3)  034650                                                                           T39::
10240  034650  012737  034732  002362            MOV     #24$,RETADR     ;SET TEST EXIT ADDRESS FOR ERRORS
10241  034656  004737  005512                    JSR     PC,INITRN       ;MST CLR, LOAD 2 SOM'S
10242  034662  000226                            SYNCH
10243  034664  000341                            CRC2!CRC1!IDLE!DDCMP
10244  034666  012737  000000  002422            MOV     #000,TXWORD
10245  034674  004737  005146                    JSR     PC,LDTXSI       ;LOAD 000 CHAR INTO TX SILO
10246  034700  004737  005226                    JSR     PC,STPLU        ;CLOCK LINE UNIT UNTIL LINE GOES MARKING
10247  034704  000063                            51.
10248  034706  004737  007326                    JSR     PC,RDRXSI       ;READ 000 CHAR
10249  034712  004737  007722                    JSR     PC,CKDATA       ;READ AND CHECK FOR MARK CHAR (377)
10250  034716  000377                            377
10251  034720  000000                            000
10252  034722  004737  007722                    JSR     PC,CKDATA       ;READ AND CHECK FOR ANOTHER MARK CHAR
10253  034726  000377                            377
10254  034730  000000                            000
```

```
10255  034732  004737  003576          24$:    JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR TO CLEAN UP
10256  034736                          ENDTST
  (3)  034736                                                                   L10073:
  (3)  034736  104401                                                                   TRAP    C$ETST
10257
10258
10259
10260
10261
10262                                   ;;*************************************************************************
10263                                   .SBTTL      TEST 40 - MSG TERMINATION WITH GA CHARS - BIT MODE,NO CRC
10264                                   ;*
10265                                   ;* THE DEVICE IS ENABLED FOR TRANSMIT AND RECEIVE, AND A MESSAGE IS
10266                                   ;* INITIATED IN BIT MODE.
10267                                   ;* 2 FLAG CHARACTERS ARE SENT, FOLLOWED BY
10268                                   ;* THE FOLLOWING DATA CHARACTERS : 000, 125, 252, 377, 000. THEN THE LOOP
10269                                   ;* MODE BIT (STRIP) IS SET AND 2 TERMINATING GO-AHEAD CHARACTERS ARE
10270                                   ;* SENT. EACH USYRT RCV FLAG IS TIMED AS IT IS RECEIVED, AND THE 5 DATA
10271                                   ;* WORDS ARE READ AND COMPARED TO EXPECTED VALUES.
10272                                   ;* ALSO, THE FIRST GA CHAR IS CHECKED BY SCANNING THE TXDATA BIT AS THE GA
10273                                   ;* IS BEING TRANSMITTED (GA = 376 OCTAL).
10274                                   ;* THE TEST ALSO CHECKS FOR SETTING OF RAB AND EBLK
10275                                   ;* IN LOOP MODE.
10276                                   ;;*************************************************************************
10277  034740                           BGNTST
  (3)  034740                                                                   T40::
10278  034740  012737  035074  002362          MOV     #24$,RETADR     ;SET TEST EXIT ADRS FOR ERRORS
10279  034746  004737  005512                  JSR     PC,INITRN       ;MST CLR, LOAD 2 SOM'S
10280  034752  000000                          000
10281  034754  000310                          CRC2!CRC1!STRIP
10282  034756  004737  010770                  JSR     PC,LODMSG       ;LOAD DATA CHARS INTO TX SILO
10283  034762  003224                          MSG1+4
10284  034764  000005                          5
10285  034766  012737  005000  002422          MOV     #TXGOA!TXEOM,TXWORD
10286  034774  004737  005146                  JSR     PC,LDTXSI       ;LOAD A GA CHAR INTO TX SILO
10287  035000  004737  005146                  JSR     PC,LDTXSI       ;LOAD ANOTHER GA
10288  035004  004737  005120                  JSR     PC,WAIT50       ;ALLOW SILO TO RIPPLE
10289  035010  004737  005226                  JSR     PC,STPLU        ;CLOCK LU UNTIL GA CHAR IS TX'ING
10290  035014  100071                          CHPCHK!57.
10291  035016  004737  011150                  JSR     PC,CKTBIT       ;SCAN TXDATA BIT FOR GA CHAR
10292  035022  000376                          376
10293  035024  004737  007722                  JSR     PC,CKDATA       ;RCV 000 CHAR, CLK 125
10294  035030  000000                          000
10295  035032  000000                          0
10296  035034  004737  007722                  JSR     PC,CKDATA       ;RCV 125 CHAR, CLK 252
10297  035040  000125                          125
10298  035042  000000                          0
10299  035044  004737  007722                  JSR     PC,CKDATA       ;RCV 252 CHAR, CLK 377
10300  035050  000252                          252
10301  035052  000000                          0
10302  035054  004737  007722                  JSR     PC,CKDATA       ;RCV 377 CHAR
10303  035060  000377                          377
10304  035062  000010                          8.
10305  035064  004737  007722                  JSR     PC,CKDATA       ;RCV 000 CHAR, CHK RAB = 1, EBLK = 1
10306  035070  003000                          3000
10307  035072  000010                          8.
```

```
10308  035074  004737  003576          24$:    JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
10309  035100                          ENDTST
  (3)  035100                                                                   L10074:
  (3)  035100  104401                                                                   TRAP    C$ETST
10310
10311
10312
10313
10314
10315                                   ;;*************************************************************************
10316                                   .SBTTL      TEST 41 - IDLE SYNCHS TEST - CHAR MODE
10317                                   ;*
10318                                   ;* THE DEVICE IS ENABLED FOR TRANSMIT AND RECEIVE, AND A MESSAGE IS
10319                                   ;* INITIATED IN CHAR MODE. 24(DEC) SYNCHS ARE SENT.
10320                                   ;* EACH SYNCH IS TIMED AS IT IS RECEIVED, AND THE BITS ARE CHECKED
10321                                   ;* FOR A VALID SYNCH CHAR FOR EACH OF THE 22 SYNCHS WHICH FOLLOW
10322                                   ;* THE FIRST TWO (THESE PERFORM SYNCHRONIZATION, AND ARE NOT READ).
10323                                   ;* WHILE THE LAST SYNCH IS BEING TRANSMITTED, OC IS SET, AND THE
10324                                   ;* NEXT CHAR RCV'D AFTER THE SYNCH IS CHECKED TO BE 377 (LINE MARKING).
10325                                   ;* THEN, A MASTER CLEAR IS ISSUED.
10326                                   ;* THE SYNCH CHAR USED IS 226 (OCTAL).
10327                                   ;;*************************************************************************
10328  035102                          BGNTST
  (3)  035102                                                                   T41::
10329  035102  012737  035242  002362          MOV     #24$,RETADR     ;SET TEST EXIT ADRS FOR ERRORS
10330  035110  004737  005512                  JSR     PC,INITRN       ;MST CLR, LOAD 2 SOM'S
10331  035114  000226                          SYNCH
10332  035116  000341                          CRC2!CRC1!IDLE!DDCMP
10333  035120  012701  000026                  MOV     #22.,R1         ;INIT COUNTER
10334  035124  012737  000226  002422          MOV     #SYNCH,TXWORD
10335  035132  004737  005146          6$:     JSR     PC,LDTXSI       ;LOAD AN SOM INTO TX SILO
10336  035136  005301                          DEC     R1              ;DECR COUNTER
10337  035140  001374                          BNE     6$              ;BR IF MORE TO LOAD
10338  035142  004737  005120                  JSR     PC,WAIT50       ;ALLOW SILO TO RIPPLE
10339  035146  004737  007406                  JSR     PC,RCV1ST       ;CLK LU UNTIL 3RD SYNCH RCV'D (RCVR IS ACTIVE)
10340  035152  000030                          24.
10341  035154  012701  000025                  MOV     #21.,R1         ;INIT COUNTER
10342  035160  004737  007722          8$:     JSR     PC,CKDATA       ;READ A SYNCH, CLK NEXT ONE
10343  035164  000226                          SYNCH
10344  035166  000010                          8.
10345  035170  005301                          DEC     R1              ;DERC COUNTER
10346  035172  001372                          BNE     8$              ;BR IF NOT ALL CHECKED
10347  035174  004737  007722                  JSR     PC,CKDATA       ;CHECK LAST SYNCH
10348  035200  000226                          SYNCH
10349  035202  000004                          4
10350  035204  012737  000011  002400          MOV     #11,REGNUM      ;SET REG NO. = 11
10351  035212  112737  000200  002366          MOVB    #OC,WRIBYT
10352  035220  004737  003722                  JSR     PC,WRITLU       ;SET OC IN REG 11
10353  035224  004737  005226                  JSR     PC,STPLU        ;FINISH CLOCKING CHAR, AND THEN SOME
10354  035230  000014                          12.
10355  035232  004737  007722                  JSR     PC,CKDATA       ;RCV A MARK CHAR, CHK IT
10356  035236  000377                          377
10357  035240  000000                          0
10358  035242  004737  003576          24$:    JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR TO CLEAN UP
10359  035246                          ENDTST
  (3)  035246                                                                   L10075:
```

```
  (3)  035246  104401                                                    TRAP    C$ETST
10360
10361
10362
10363
10364
10365                          ;;*****************************************************************************
10366                          .SBTTL      TEST 42 - STRIP SYNCH TEST
10367                          ;*
10368                          ;* THE DEVICE IS ENABLED FOR TRANSMIT AND RECEIVE, AND A MESSAGE IS
10369                          ;* INITIATED IN CHAR MODE AND WITH THE STRIP SYNCH
10370                          ;* BIT SET. THEN 24 (DEC) SYNCHS ARE SENT
10371                          ;* FOLLOWED BY THE FOLLOWING DATA CHARACTERS : 377, 000, 125, 252,
10372                          ;* AND 2 TERMINATING SYNCHS.
10373                          ;* EACH OF THE 23 SYNCHS AFTER THE FIRST ARE CHECKED AT THE TRANSMITTER OUTPUT,
10374                          ;* BY SCANNING THE TXDATA BIT.
10375                          ;* EACH USYRT RCV FLAG IS TIMED AS IT IS RECEIVED, AND THE 4 DATA WORDS
10376                          ;* ARE READ AND COMPARED TO EXPECTED VALUES.
10377                          ;* FINALLY, THE LINE UNIT IS CLOCKED FOR SEVERAL CHAR TIMES, AND A CHECK
10378                          ;* IS MADE FOR OACT = 0 (TEOM SHOULD CAUSE TX ENABLE TO DROP).
10379                          ;* THE ABOVE TEST IS REPEATED FOR EACH OF THE FOLLOWING SYNCH CHAR DATA
10380                          ;* PATTERNS : 226,000,125,252,376,177.
10381                          ;*****************************************************************************
10382  035250                  BGNTST
  (3)  035250                                                                                    T42::
10383  035250  012737  035470  002362          MOV     #24$,RETADR     ;SET TEST EXIT ADRS FOR ERRORS
10384  035256  012701  035476                  MOV     #SYNPAT,R1      ;GET POINTER TO DATA
10385  035262  011137  035272          2$:     MOV     (R1),3$         ;GET A SYNCH PATTERN
10386  035266  004737  005512                  JSR     PC,INITRN       ;MST CLR, LOAD 2 SOM'S
10387  035272  000000                  3$:     .WORD   0               ;SYNCH PATTERN GOES HERE
                                               CRC2!CRC1!STRIP!DDCMP
10388  035274  000311
10389  035276  012737  000400  002422          MOV     #TXSOM,TXWORD
10390  035304  012702  000026                  MOV     #22.,R2         ;LOAD 22 SOM'S INTO TX SILO
10391  035310  004737  005146          6$:     JSR     PC,LDTXSI
10392  035314  005302                          DEC     R2
10393  035316  001374                          BNE     6$
10394  035320  004737  010770                  JSR     PC,LODMSG       ;LOAD DATA CHARS INTO TX SILO
10395  035324  003246                          MSG4
10396  035326  000006                          6
10397  035330  012737  001000  002422          MOV     #TXEOM,TXWORD
10398  035336  004737  005146                  JSR     PC,LDTXSI       ;LOAD A TEOM
10399  035342  004737  005146                  JSR     PC,LDTXSI       ;LOAD ANOTHER TEOM
10400  035346  004737  005120                  JSR     PC,WAIT50       ;ALLOW SILO TO RIPPLE
10401  035352  011137  035374                  MOV     (R1),16$        ;GET CURRENT SYNCH PATTERN
10402  035356  012702  000027                  MOV     #23.,R2         ;INIT COUNTER
10403  035362  004737  005226                  JSR     PC,STPLU        ;CLOCK OUT FIRST SYNCH
10404  035366  100010                          CHPCHK!8.
10405  035370  004737  011150          14$:    JSR     PC,CKTBIT       ;CHECK TX'D SYNCH
10406  035374  000000                  16$:    .WORD   0               ;SYNCH PATTERN GOES HERE
10407  035376  005302                          DEC     R2              ;DECR COUNTER
10408  035400  001373                          BNE     14$             ;BR IF NOT DONE CHECKING LAST 23 SYNCHS
10409  035402  004737  007406                  JSR     PC,RCV1ST       ;CLOCK UNTIL 000 CHAR RCV'D
10410  035406  000010                          8.
10411  035410  004737  007722                  JSR     PC,CKDATA       ;RCV 377, CLOCK 000
10412  035414  000377                          377
10413  035416  000010                          8.
```

```
10414  035420  004737  007722          JSR     PC,CKDATA       ;RCV 000, CLK 125
10415  035424  000000                  000
10416  035426  000010                  8.
10417  035430  004737  007722          JSR     PC,CKDATA       ;RCV 125, CLK 252
10418  035434  000125                  125
10419  035436  000010                  8.
10420  035440  004737  007722          JSR     PC,CKDATA       ;RCV 252, CLK END OF MSG
10421  035444  000252                  252
10422  035446  000040                  32.
10423  035450  004737  005324          JSR     PC,OACTIV       ;CHK FOR OACT = 0
10424  035454  000000                  0
10425  035456  062701  000002          ADD     #2,R1           ;INIT SYNCH PATTERN POINTER
10426  035462  020127  035512          CMP     R1,#SYNPAT+12.  ;SEE IF ALL PATTERNS CHECKED YET
10427  035466  103675                  BLO     2$              ;BR IF NOT YET
10428  035470  004737  003576  24$:    JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR TO CLEAN UP
10429  035474                  ENDTST
  (3)  035474                                                          L10076:
  (3)  035474  104401                                                          TRAP    C$ETST
10430
10431  035476  000226          SYNPAT: 226
10432  035500  000000                  000
10433  035502  000125                  125
10434  035504  000252                  252
10435  035506  000376                  376
10436  035510  000177                  177
10437
10438
10439
10440
10441
```

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

035512                          BGNHRD
(3)  035512  000022                                             .WORD L10077-L$HARD/2
(3)  035514                                                 L$HARD::

035514                          GPRMA   ADDRES,2,0,160000,177776,YES
(4)  035514  001031                                             .WORD   T$CODE
(4)  035516  035560                                             .WORD   ADDRES
(4)  035520  160000                                             .WORD   T$LOLIM
(4)  035522  177776                                             .WORD   T$HILIM
035524                          GPRMA   VECTOR,4,0,0,674,YES
(4)  035524  002031                                             .WORD   T$CODE
(4)  035526  035606                                             .WORD   VECTOR
(4)  035530  000000                                             .WORD   T$LOLIM
(4)  035532  000674                                             .WORD   T$HILIM
035534                          GPRMD   PRIRTY,6,0,7000,4,7,YES
(4)  035534  003032                                             .WORD   T$CODE
(4)  035536  035637                                             .WORD   PRIRTY
(4)  035540  007000                                             .WORD   7000
(4)  035542  000004                                             .WORD   T$LOLIM
(4)  035544  000007                                             .WORD   T$HILIM
035546                                  GPRMD   ISRUN,24,0,7,0,7,YES
(4)  035546  012032                                             .WORD   T$CODE
(4)  035550  035670                                             .WORD   ISRUN
(4)  035552  000007                                             .WORD   7
(4)  035554  000000                                             .WORD   T$LOLIM
(4)  035556  000007                                             .WORD   T$HILIM

035560                                  ENDHRD
(2)                                                             .EVEN
(3)  035560                                                 L10077:

035560  042504  044526  042503  ADDRES: .ASCIZ  /DEVICE CSR ADDRESS : /
035566  041440  051123  040440
035574  042104  042522  051523
035602  035040  000040
035606  042504  044526  042503  VECTOR: .ASCIZ  /DEVICE VECTOR ADDRESS : /
035614  053040  041505  047524
035622  020122  042101  051104
035630  051505  020123  020072
035636     000
035637     104  053105  041511  PRIRTY: .ASCIZ  /DEVICE PRIORITY LEVEL : /
035644  020105  051120  047511
035652  044522  054524  046040
```

```
                035660  053105  046105  035040
                035666  000040
10468           035670  044515  051103  050117  ISRUN:  .ASCIZ  /MICROPROCESSOR RUN SWITCH - TYPE 0 IF OFF, 1 IF ON : /
                035676  047522  042503  051523
                035704  051117  051040  047125
                035712  051440  044527  041524
                035720  020110  020055  054524
                035726  042520  030040  044440
                035734  020106  043117  026106
                035742  030440  044440  020106
                035750  047117  035040  000040
10469                                           .EVEN
10470
10471
10472
10473
10474
10475
```

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

035756                                  BGNSFT
(3)  035756  000000                                                     .WORD L10100-L$SOFT/2
(3)  035760                                                     L$SOFT::
035760                                  ENDSFT
(2)
(3)  035760                                                             .EVEN
                                                                L10100:

                                .EVEN


                                ;****** PATCH AREA FOR DEBUG ******
035760                          PATCH:
             036160                     .=.+200
036160  000240                          NOP
036162  000240                          NOP
036164  000240                          NOP
                                ;************************************


036166                                  ENDMOD

036166                                  LASTAD
(2)
(4)  036166  000000                                                     .EVEN
(4)  036170  000000                                                     .WORD   0
(3)  036172                                                             .WORD   0
                                L$LAST::

             000001             .END
```

```
ABORT = 000004          5590#
ADDRES  035560          7625    7631    7646    7666    7684    7705    7723    7742    7761   10458   10465#
ADR   = 000020 G        5549#
ANBITS  002561          5987#   8654    8655    8705    8706    8752    8753
APA   = 000200          5768#
ASBC0 = 000020          5725#
ASBC1 = 000040          5724#
ASBC2 = 000100          5723#
ASSEMB= 000010          5406
AXNUM   002402          5908#   6553    6591    6604    6629    6631    6637*   6643*   6644    6646*   6648    6839    6847*
                        6890*   7086    7092*   7121*   7127*   7368    7370*   7378*   7387*   8511*   8523*   8527*   8537
                        8549*   8560*   8588*   8595*   8597    8609*   8651*   8666*   8702*   8717*   8749*   8764*   8809*
                        8826*   8863*   8943*   8954*   9059*   9365*   9431*   9541*   9621*   9704*   9767*   9846*   9895*
                        9951*  10133*  10185*
AX0.15= 002322          5836#   6636    7655    7674    7694    7713    7731    7751
AX0.16= 002324          5837#   7655    7674    7694    7713    7731    7751
AX1   = 000001          5621#   5693#
AX1.15= 002326          5838#   7655    7674    7694    7713    7731    7751
AX1.16= 002330          5839#   7655    7674    7694    7713    7731    7751
AX2   = 000002          5620#   5692#
AX2.15= 002332          5840#   7657    7676    7696    7715    7733    7753
AX2.16= 002334          5841#   7657    7676    7696    7715    7733    7753
AX3.15= 002336          5842#   7657    7676    7696    7715    7733    7753
AX3.16= 002340          5843#   7657    7676    7696    7715    7733    7753
AX315U= 000332          5786#   8539    8599    8816
A1      024166          8427    8453    8472    8481    8491#
A10     034142         10028   10103#
A2      026566          8928    8967#
A3      027246          8992    9096    9100#
A4      027362          9122    9148#
A5      027472          9171    9194#
A6      027666          9219    9254#
A7      030232          9280    9296    9305    9317    9336    9340    9344#
A8      030446          9361    9400#
A9      030776          9418    9480#
BADDAT  002406          5910#   7258*   7259*   7280*   7281*   7634    7649    7688    7745    8018*   8052*   8083*   8115*
                        8151*   8193*   8245*   8281*   8315*   8349*   8383*   8447*   8466*   8485*   8544*   8555*   8604*
                        8614*   8661*   8671*   8712*   8721*   8759*   8768*   8821*   8831*   8879*   8902*   8949*   8959*
                        9064*   9087*   9563*   9578*   9661*   9726*   9807*   9851*   9955*
BCC   = 000001          5669#   7284    7286    7292
BCCCHK= 100000          5851#   7282
BIT0  = 000001 G        5549#   5571    5583    5592    5621    5633    5645    5657    5669    5681    5693    5705    5717
                        5729    5741    5750    5762    5775    5785    5796    5868    6631    6672    6801    7013    7054
                        7094    7462    7853
BIT00 = 000001 G        5549#
BIT01 = 000002 G        5549#
BIT02 = 000004 G        5549#
BIT03 = 000010 G        5549#
BIT04 = 000020 G        5549#
BIT05 = 000040 G        5549#
BIT06 = 000100 G        5549#
BIT07 = 000200 G        5549#
BIT08 = 000400 G        5549#
BIT09 = 001000 G        5549#
BIT1  = 000002 G        5549#   5570    5582    5591    5610    5620    5632    5644    5656    5668    5680    5692    5704
                        5716    5728    5740    5749    5761    5774    5784    5795    5869    6688    6997    7108
```

```
BIT10 = 002000 G   5549# 5806  5818
BIT11 = 004000 G   5549# 5805  5817
BIT12 = 010000 G   5549#
BIT13 = 020000 G   5549#
BIT14 = 040000 G   5549#
BIT15 = 100000 G   5549# 5849  5851  5852  6769  6923
BIT2  = 000004 G   5549# 5569  5581  5590  5609  5619  5631  5643  5655  5667  5679  5691  5703
                   5715  5727  5739  5748  5760  5773  5794
BIT3  = 000010 G   5549# 5568  5580  5589  5608  5618  5630  5642  5654  5666  5678  5690  5702
                   5714  5726  5738  5747  5759  5772  5783
BIT4  = 000020 G   5549# 5567  5579  5607  5617  5629  5641  5653  5665  5677  5689  5701  5713
                   5725  5737  5758  5771  5782
BIT5  = 000040 G   5549# 5578  5599  5606  5616  5628  5640  5652  5664  5676  5688  5700  5712
                   5724  5736  5757  5770  5793
BIT6  = 000100 G   5549# 5566  5577  5598  5605  5615  5627  5639  5651  5663  5675  5687  5699
                   5711  5723  5735  5756  5769  5781  5792
BIT7  = 000200 G   5549# 5565  5576  5588  5597  5604  5626  5638  5650  5662  5674  5686  5698
                   5710  5722  5734  5746  5755  5768  5780  5791  7252  7253
BIT8  = 000400 G   5549# 5808  5820
BIT9  = 001000 G   5549# 5807  5819
BOE   = 000400 G   5549#
BPOLL = 000100     5598#
BSEL1   002450     5929# 6422* 6424* 6425* 6438* 6439* 6444* 6532* 6534* 6635* 6773* 6774* 6776*
                   6866* 6867* 6872* 6885* 7868* 7869* 7870  8105* 8804*
BSEL2   002452     5930# 7870* 7871* 8440  8460  8479
BSEL4   002454     5931# 6470  6491* 8143*
CARR  = 000001     5681#
CHPCHK= 100000     5849# 9128  9177  9228  9286  9327  9371  9424  9508  10138 10290 10404
CHPTYP  002430     5919# 6770  6880* 6884* 6924  7822* 9912  9934
CKDATA  007722     7243# 10054 10083 10249 10252 10293 10296 10299 10302 10305 10342 10347 10355
                  10411  10414 10417 10420
CKTBIT  011150     7458# 9510  10291 10405
CRCCHK= 100000     5852# 7513
CRCTY0= 000001     5775#
CRCTY1= 000002     5774#
CRCTY2= 000004     5773#
CRC1  = 000100     5627# 9222  9700  9763  9882  10126 10178 10243 10281 10332 10388
CRC2  = 000200     5626# 9222  9700  9763  9882  10126 10178 10243 10281 10332 10388
CS    = 000004     5679#
C$AU  = 000052     5406# 7964
C$AUTO= 000061     5406# 7909
C$BRK = 000022     5406#
C$BSEG= 000004     5406# 8043  8273  8307  8341  8375  8650  8701  8748  8808  8869
C$BSUB= 000002     5406# 8867  8893  8929
C$CEFG= 000045     5406#
C$CLCK= 000062     5406#
C$CLEA= 000012     5406# 7926
C$CLOS= 000035     5406#
C$CLP1= 000006     5406#
C$CVEC= 000036     5406#
C$DCLN= 000044     5406#
C$DODU= 000051     5406# 7906
C$DRPT= 000024     5406#
C$DU  = 000053     5406# 7945
C$EDIT= 000000     5406# 5446
C$ERDF= 000055     5406# 6678  6684  6694  6700  6807  6813  6971  7003  7009  7019  7025  7060
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                    7066   7100   7106   7114   7120   7266   7271   7290   7296   7305   7311   7320   7326
                    7335   7341   7473   7479   7995   8021   8055   8086   8118   8154   8196   8248   8284
                    8318   8352   8386   8450   8469   8488   8521   8535   8547   8558   8607   8617   8664
                    8674   8715   8724   8762   8771   8824   8834   8882   8905   8952   8962   9067   9090
                    9252   9295   9304   9316   9335   9343   9566   9581   9664   9729   9810   9854   9958
C$ERHR= 000056       5406#
C$ERRO= 000060       5406#
C$ERSF= 000054       5406#
C$ERSO= 000057       5406#
C$ESCA= 000010       5406#  8197   8249   8522   8536   8548   8559   8608   8618   8665   8716   8763   8825
                    8953   8963   9068   9091
C$ESEG= 000005       5406#  8057   8286   8320   8354   8388   8676   8726   8773   8836   8884
C$ESUB= 000003       5406#  8889   8907   8968
C$ETST= 000001       5406#  7998   8023   8061   8088   8120   8156   8202   8256   8290   8324   8358   8392
                    8493   8564   8625   8680   8730   8777   8841   8908   8969   9101   9150   9196   9256
                    9345   9401   9481   9516   9596   9679   9742   9825   9857   10003  10104  10156  10224
                   10256  10309  10359  10429
C$EXIT= 000032       5406#
C$GETB= 000026       5406#
C$GETW= 000027       5406#
C$GMAN= 000043       5406#
C$GPHR= 000042       5406#  7860
C$GPLO= 000030       5406#
C$GPRI= 000040       5406#
C$INIT= 000011       5406#  7883
C$INLP= 000020       5406#
C$MANI= 000050       5406#
C$MEM = 000031       5406#
C$MSG = 000023       5406#  7626   7639   7658   7677   7697   7716   7734   7754   7768
C$OPEN= 000034       5406#
C$PNTB= 000014       5406#  7625   7631   7632   7633   7634   7646   7647   7648   7649   7665   7666   7667
                    7668   7684   7685   7686   7687   7688   7704   7705   7706   7707   7723   7724   7725
                    7741   7742   7743   7744   7745   7761   7762   7763
C$PNTF= 000017       5406#  7944   8426   8452   8471   8490
C$PNTS= 000016       5406#
C$PNTX= 000015       5406#  7635   7636   7637   7638   7650   7651   7652   7653   7654   7655   7656   7657
                    7669   7670   7671   7672   7673   7674   7675   7676   7689   7690   7691   7692   7693
                    7694   7695   7696   7708   7709   7710   7711   7712   7713   7714   7715   7726   7727
                    7728   7729   7730   7731   7732   7733   7746   7747   7748   7749   7750   7751   7752
                    7753   7764   7765   7766   7767
C$QIO = 000377       5406#
C$RDBU= 000007       5406#
C$REFG= 000047       5406#  7834   7837   7840   7843
C$RESE= 000033       5406#  7942   8104
C$REVI= 000003       5406#  5446
C$RFLA= 000021       5406#
C$RPT = 000025       5406#  7785
C$SEFG= 000046       5406#
C$SPRI= 000041       5406#  7899   7987
C$SVEC= 000037       5406#
C$TPRI= 000013       5406#
DDC   = 000100       5769#
DDCMP = 000001       5633#  5705#  9125   9222   9283   9324   9364   9499   9537   9700   10041  10126  10243
                   10332  10388
DEVMAP  002434       5921#  7849*  7864*
DEVPTR  002436       5922#  7853*  7862*  7864   7865*
```

```
DFPTBL  002252 G        5491#
DH1     014240          7608#   7633    7668    7725    7744    7763
DH2     014262          7609#   7635    7650    7669    7689    7708    7726    7746    7764
DH3     014311          7610#   7635    7650    7669    7689    7708    7726    7746    7764
DH4     014347          7611#   7637    7652    7671    7691    7710    7728    7748    7766
DH5     014411          6630    7612#
DH6     014414          6633    7613#
DH7     014417          7614#   7654    7673    7693    7712    7730    7750
DH8     014451          7615#   7654    7673    7693    7712    7730    7750
DH9     014510          7616#   7656    7675    7695    7714    7732    7752
DIAGMC= 000000          5406
DISILO  002426          5918#   6556    6593    6607    7821*   9843*   9855*   9888*   10001*
DISSI = 000040          5616#   5688#   9841    9843    9886    9888    9993
DTR   = 000100          5605#   5675#
EBLK  = 000002          5668#   7299    7301    7307
EF.CON= 000036 G        5549#   7843
EF.NEW= 000035 G        5549#   7840
EF.PWR= 000034 G        5549#
EF.RES= 000037 G        5549#   7837
EF.STA= 000040 G        5549#   7834
EM1     012101          7549#   7995
EM10    012423          6700    7558#
EM11    012444          6807    7559#
EM12    012461          6813    7560#
EM13    012502          7561#   9316
EM14    012532          7562#   9304    9335
EM15    012547          7563#   9343
EM16    012576          7564#   9295
EM17    012617          7003    7565#
EM18    012634          7009    7566#
EM19    012655          7019    7567#
EM2     012135          7550#   8021    8086    8196    8547    8558    8905
EM20    012672          7025    7568#
EM21    012713          7060    7569#
EM22    012730          7066    7570#
EM23    012751          7571#
EM24    012772          7572#
EM25    013007          7573#
EM26    013043          7574#   9566    9664    9729    9810    9958
EM27    013075          7575#   9581
EM28    013126          7106    7576#
EM29    013147          7100    7577#
EM3     012174          7551#   8055    8154    8248    8284    8318    8352    8386    8607    8617    8664    8674    8715
                        8724    8762    8771    8824    8834    8882    8952    8962    9067    9090    9854
EM30    013164          7120    7578#
EM31    013205          7114    7579#
EM32    013222          7473    7580#
EM33    013251          7479    7581#
EM34    013274          7271    7582#
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EM36    013342          7296    7584#
EM37    013356          7305    7585#
EM38    013377          7311    7586#
EM39    013414          7320    7587#
EM4     012213          7552#   8118
EM40    013434          7326    7588#
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EM42    013471            7341    7590#
EM43    013506            7591#
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EM47    013640            7595#
EM48    013673            7596#
EM49    013726            7597#
EM5     012266            7553#   8450    8488
EM50    013765            7598#
EM51    014021            7599#
EM52    014061            7600#   8521
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EM54    014162            7266    7602#
EM6     012317            7554#   8469
EM60    014204            7603#   9252
EM65    014220            6971    7604#
EM7     012350            6678    7555#
EM8     012365            6684    7556#
EM9     012406            6694    7557#
ENAX  = 000004            5619#   5691#   6555    6606
ENDIT   021440            7844    7882#
ENDPAT  003220            6327#
ENDTRN  006246            6953#   9147    9193    9253    9399    9479
EOM   = 000002            5591#
ERRFLG  002356            5898#
ERROR1  002420            5915#   6551*   6564*   6589*   6615*   7823*   8516    8530
ERR1    014554 G          7624#   7995
ERR2    014606 G          7630#   8021    8055    8086    8118    8154    8196    8248    8284    8318    8352    8386    8450
                          8469    8488
ERR3    015114 G          7645#   8547    8558    8607    8617    8664    8674    8715    8724    8762    8771    8824    8834
                          8905    8952    8962    9067    9090    9566    9581    9664    9729    9810    9854    9958
ERR4    015576 G          6678    6684    6694    6700    6807    6813    6971    7003    7009    7019    7025    7060    7066
                          7266    7473    7479    7664#
ERR5    016254 G          7683#   8882
ERR6    016766 G          7100    7106    7114    7120    7703#
ERR7    017444 G          7722#   9252    9295    9304    9316    9335    9343
ERR8    020076 G          7271    7290    7296    7305    7311    7320    7326    7335    7341    7740#
ERR9    020604 G          7760#   8521    8535
EVL   = 000004 G          5549#
E$END = 002100            5406#
E$LOAD= 000035            5406#   5446
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FMT10   011671            7542#   7665    7704    7741
FMT11   011722            7543#   7685
FMT19   011761            7544#   8426
FMT2    011436            7534#   7632    7647    7667    7686    7706    7724    7743    7762
FMT24   012012            7545#   8452    8471    8490
FMT27   021554            7944    7947#
FMT3    011460            7535#   7634    7649    7688    7745
FMT4    011522            7536#   7635    7650    7654    7669    7673    7689    7693    7708    7712    7726    7730    7746
                          7750    7764
FMT5    011535            7537#   7636    7651    7655    7670    7674    7690    7694    7709    7713    7727    7731    7747
                          7751    7765
FMT6    011565            7538#   7638    7653    7657    7672    7676    7692    7696    7711    7715    7729    7733    7749
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                    7753  7767
FMT7     011620     7539# 7633  7668  7725  7744  7763
FMT8     011630     7540# 7648  7687  7707
FMT9     011664     7541# 7637  7652  7656  7671  7675  7691  7695  7710  7714  7728  7732  7748
                    7752  7766
FRSTIM   002412     5912# 7825  7832*
F$AU   = 000015     5406# 7963  7964
F$AUTO= 000020      5406# 7897  7909
F$BGN  = 000040     5406# 5412  7624  7630  7645  7664  7683  7703  7722  7740  7760  7783  7799
                    7817  7897  7923  7940  7963  7985  7998  8010  8023  8038  8043  8061  8072
                    8088  8099  8120  8136  8156  8173  8197  8202  8217  8249  8256  8268  8273
                    8290  8302  8307  8324  8336  8341  8358  8370  8375  8392  8419  8493  8509
                    8522  8536  8548  8559  8564  8580  8608  8618  8625  8646  8650  8665  8680
                    8697  8701  8716  8730  8744  8748  8763  8777  8802  8808  8825  8841  8858
                    8867  8869  8889  8893  8907  8908  8926  8929  8953  8963  8968  8969  8991
                    9068  9091  9101  9121  9150  9170  9196  9218  9256  9276  9345  9360  9401
                    9417  9481  9496  9516  9532  9596  9612  9679  9695  9742  9758  9825  9838
                    9857  9874  10003 10027 10104 10122 10156 10174 10224 10239 10256 10277 10309
                    10328 10359 10382 10429 10456 10489 10513
F$CLEA= 000007      5406# 7923  7926
F$DU   = 000016     5406# 7940  7945
F$END  = 000041     5406# 5412  7626  7639  7658  7677  7697  7716  7734  7754  7768  7785  7883
                    7909  7926  7945  7964  7985  7998  8010  8023  8038  8057  8061  8072  8088
                    8099  8120  8136  8156  8173  8197  8202  8217  8249  8256  8268  8286  8290
                    8302  8320  8324  8336  8354  8358  8370  8388  8392  8419  8493  8509  8522
                    8536  8548  8559  8564  8580  8608  8618  8625  8646  8665  8676  8680  8697
                    8716  8726  8730  8744  8763  8773  8777  8802  8825  8836  8841  8858  8867
                    8884  8889  8893  8907  8908  8926  8929  8953  8963  8968  8969  8991  9068
                    9091  9101  9121  9150  9170  9196  9218  9256  9276  9345  9360  9401  9417
                    9481  9496  9516  9532  9596  9612  9679  9695  9742  9758  9825  9838  9857
                    9874  10003 10027 10104 10122 10156 10174 10224 10239 10256 10277 10309 10328
                    10359 10382 10429 10463 10492 10513
F$HARD= 000004      5406# 10456 10463
F$HW   = 000013     5406# 5491  5505
F$INIT= 000006      5406# 7817  7883
F$JMP  = 000050     5406#
F$MOD  = 000000     5406# 5412  10513
F$MSG  = 000011     5406# 7624  7626  7630  7639  7645  7658  7664  7677  7683  7697  7703  7716
                    7722  7734  7740  7754  7760  7768
F$PROT= 000021      5406# 7799  7803
F$PWR  = 000017     5406#
F$RPT  = 000012     5406# 7783  7785
F$SEG  = 000003     5406# 8043  8057  8273  8286  8307  8320  8341  8354  8375  8388  8650  8676
                    8701  8726  8748  8773  8808  8836  8869  8884
F$SOFT= 000005      5406# 10489 10492
F$SRV  = 000010     5406#
F$SUB  = 000002     5406# 8867  8889  8893  8907  8929  8968
F$SW   = 000014     5406# 5519  5522
F$TEST= 000001      5406# 7985  7998  8010  8023  8038  8061  8072  8088  8099  8120  8136  8156
                    8173  8202  8217  8256  8268  8290  8302  8324  8336  8358  8370  8392  8419
                    8493  8509  8564  8580  8625  8646  8680  8697  8730  8744  8777  8802  8841
                    8858  8908  8926  8969  8991  9101  9121  9150  9170  9196  9218  9256  9276
                    9345  9360  9401  9417  9481  9496  9516  9532  9596  9612  9679  9695  9742
                    9758  9825  9838  9857  9874  10003 10027 10104 10122 10156 10174 10224 10239
                    10256 10277 10309 10328 10359 10382 10429
GETALL   004500     6628# 6676  6682  6692  6698  6805  6811  6969  7001  7007  7017  7023  7058
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                    7064    7098    7104    7112    7118    7264    7269    7288    7294    7303    7309    7318    7324
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                    8769    8822    8832    8880    8903    8950    8960    9065    9088    9250    9293    9302    9314
                    9333    9341    9564    9579    9662    9727    9808    9852    9956
GETPRM  021262      7845    7856#   7863
GETREG  003770      6505#   6634    8019    8053    8084    8116    8152    8194    8246    8282    8316    8350    8384
                    8448    8467    8486    8519    8533
GOAH  = 000010      5589#
GOODAT  002404      5909#   7256*   7257*   7278*   7279*   7634    7649    7688    7745    8016*   8017*   8051*   8081*
                    8082*   8113*   8114*   8149*   8150*   8191*   8192*   8243*   8244*   8280*   8314*   8348*   8382*
                    8446*   8465*   8484*   8542*   8543*   8553*   8554*   8602*   8603*   8612*   8613*   8660*   8669*
                    8670*   8711*   8720*   8758*   8767*   8819*   8820*   8829*   8830*   8877*   8878*   8900*   8901*
                    8947*   8948*   8957*   8958*   9063*   9086*   9562*   9577*   9587*   9660*   9725*   9806*   9850*
                    9954*   9974*   9990*
G$CNTO= 000200      5406#
G$DISP= 000003      5406#
G$EXCP= 000400      5406#
G$HILI= 000002      5406#
G$LOLI= 000001      5406#
G$NO  = 000000      5406#
G$OFFS= 000400      5406#   10458   10459   10460   10461
G$OFSI= 000376      5406#   10458   10459   10460   10461
G$PRMA= 000001      5406#   10458   10459
G$PRMD= 000002      5406#   10460   10461
G$PRML= 000000      5406#
G$RADA= 000140      5406#
G$RADB= 000000      5406#
G$RADD= 000040      5406#
G$RADL= 000120      5406#
G$RADO= 000020      5406#   10458   10459   10460   10461
G$XFER= 000004      5406#
G$YES = 000010      5406#   10458   10459   10460   10461
HDX   = 000020      5607#   5677#
HELP  = 000001      5392#   5438    5448    5471    6395
HOE   = 100000 G    5549#
IACT  = 000100      5663#   7056    7062
IACTIV  006666      7046#   7173    7194    9552    9557    9572    9585    9593    9632    9641    9648    9653    9670
                    9676    9715    9720    9735    9739    9778    9787    9794    9799    9816    9822    9920    9945
                    9966    9982
IBE   = 010000 G    5549#
IC    = 000200      5597#   5662#   9674    9737    9820
ICIR  = 000010      5702#   7015    7021
IDL   = 000010      5772#
IDLE  = 000040      5628#   9324    9364    10126   10243   10332
IDU   = 000040 G    5549#
IER   = 020000 G    5549#
IERR  = 000002      5632#   7218    7224    9537    9617    9700    9763    9882
INITRN  005512      6837#   9123    9172    9220    9281    9322    9362    9419    9497    9876    10039   10124   10176
                    10241   10279   10330   10386
INTFLG  002354      5896#
INTGRL= 000010      5783#   5786
IRDY  = 000020      5665#   6999    7005    7184
ISIRDY  006402      6989#   7175    7188    7192    7196    7434    7440    9932    9941    9949    9962    9970    9978
                    9986    10033   10058   10068   10077   10089
ISR   = 000100 G    5549#
ISRUN   035670      10461   10468#
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I$AU   = 000041            5406#   7963#   7964#
I$AUTO= 000041             5406#   7897#   7909#
I$CLN  = 000041            5406#   7923#   7926#
I$DU   = 000041            5406#   7940#   7945#
I$HRD  = 000041           10456#  10463#
I$INIT= 000041             5406#   7817#   7883#
I$MOD  = 000041            5406#   5412#  10513#
I$MSG  = 000041            5406#   7624#   7626#   7630#   7639#   7645#   7658#   7664#   7677#   7683#   7697#   7703#   7716#
                           7722#   7734#   7740#   7754#   7760#   7768#
I$PROT= 000040             5406#   7799#
I$PTAB= 000041             5406#
I$PWR  = 000041            5406#
I$RPT  = 000041            5406#   7783#   7785#
I$SEG  = 000041            5406#   7985    8010    8038    8043#   8057#   8072    8099    8136    8173    8217    8268    8273#
                           8286#   8302    8307#   8320#   8336    8341#   8354#   8370    8375#   8388#   8419    8509    8580
                           8646    8650#   8665    8676#   8697    8701#   8716    8726#   8744    8748#   8763    8773#   8802
                           8808#   8825    8836#   8858    8867    8869#   8884#   8893    8926    8929    8991    9121    9170
                           9218    9276    9360    9417    9496    9532    9612    9695    9758    9838    9874   10027   10122
                          10174   10239   10277   10328   10382
I$SETU= 000041              5406#
I$SFT  = 000041            10489#  10492#
I$SRV  = 000041             5406#
I$SUB  = 000041             5406#   7985    8010    8038    8072    8099    8136    8173    8217    8268    8302    8336    8370
                            8419    8509    8580    8646    8697    8744    8802    8858    8867#   8889#   8893#   8907#   8926
                            8929#   8953    8963    8968#   8991    9121    9170    9218    9276    9360    9417    9496    9532
                            9612    9695    9758    9838    9874   10027   10122   10174   10239   10277   10328   10382
I$TST  = 000041             5406#   7985#   7998#   8010#   8023#   8038#   8061#   8072#   8088#   8099#   8120#   8136#   8156#
                            8173#   8197    8202#   8217#   8249    8256#   8268#   8290#   8302#   8324#   8336#   8358#   8370#
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                            8646#   8680#   8697#   8730#   8744#   8777#   8802#   8841#   8858#   8867    8893    8908#   8926#
                            8929    8969#   8991#   9068    9091    9101#   9121#   9150#   9170#   9196#   9218#   9256#   9276#
                            9345#   9360#   9401#   9417#   9481#   9496#   9516#   9532#   9596#   9612#   9679#   9695#   9742#
                            9758#   9825#   9838#   9857#   9874#  10003#  10027#  10104#  10122#  10156#  10174#  10224#  10239#
                           10256#  10277#  10309#  10328#  10359#  10382#  10429#
I422   = 000200             5780#   5786
J$JMP  = 000167             5406#
LDMSG1  011346              7503#
LDTXSI  005146              6744#   6857    6858    6916    7407    9003    9004    9028    9076    9307    9503    9546    9626
                            9709    9772    9845   10044   10066   10096   10100   10129   10181   10245   10286   10287   10335
                           10391   10398   10399
LOADAT  002410              5911#   7685    8875*   8876*
LODMSG  010770              7400#   7505   10282   10394
LOE    = 040000 G           5549#
LOGDEV  002344              5892#   7851*   7857*   7858    7860    7906    7944
LOOPIN  004046              6531#   8433
LOT    = 000010 G           5549#
LULOOP= 000010              5568#   6444    6635    6773    6866    8804
LULP   = 000040             5599#   5664#   9542    9622    9705    9768    9890
LUREG   002302              5828    5829    5830    5831    5832    5833    5834    5835    5836    5837    5838    5839    5840
                            5841    5842    5843    5886#
LUR10  = 002302             5828#   6507    7636    7651    7670    7690    7709    7727    7747    7765
LUR11  = 002304             5829#   7636    7651    7670    7690    7709    7727    7747    7765
LUR12  = 002306             5830#   7636    7651    7670    7690    7709    7727    7747    7765
LUR13  = 002310             5831#   7636    7651    7670    7690    7709    7727    7747    7765
LUR14  = 002312             5832#   7638    7653    7672    7692    7711    7729    7749    7767
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LUR15 = 002314          5833#  7638  7653  7672  7692  7711  7729  7749  7767
LUR16 = 002316          5834#  7638  7653  7672  7692  7711  7729  7749  7767
LUR17 = 002320          5835#  7638  7653  7672  7692  7711  7729  7749  7767
LUSWI1  002466          5937#
LUSWI2  002470          5938#
LUSWI3  002472          5939#
LU1MOD  002000 G        5412#
L$ACP   002110 G        5446#
L$APT   002036 G        5446#
L$AU    021606 G        5446  7963#
L$AUT   002070 G        5446#
L$AUTO  021442 G        5446  7897#
L$CCP   002106 G        5446#
L$CLEA  021522 G        5446  7923#
L$CO    002032 G        5446#
L$DEPO  002011 G        5446#
L$DESC  003470 G        5446  6388#
L$DESP  002076 G        5446#
L$DEVP  002060 G        5446#
L$DISP  002124 G        5446  5469#
L$DLY   002116 G        5446#
L$DTP   002040 G        5446#
L$DTYP  002034 G        5446#
L$DU    021524 G        5446  7940#
L$DUT   002072 G        5446#
L$DVTY  003462 G        5446  6383#
L$EF    002052 G        5446#
L$ETP   002102 G        5446#
L$EXP1  002042 G        5446#
L$EXP2  002044 G        5446#
L$EXP3  002046 G        5446#
L$EXP4  002064 G        5446#
L$EXP5  002066 G        5446#
L$HWRD  035514 G        5446  10456#
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L$HPCP  002016 G        5446#
L$HPTP  002022 G        5446#
L$HW    002252 G        5446  5491#
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L$INIT  021072 G        5446  7817#
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L$LAST  036172 G        5446  10515#
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L$LUN   002074 G        5446#
L$MREV  002050 G        5446#
L$NAME  002000 G        5446#
L$PROT  021064 G        5446  7799#
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L$REPP  002062 G        5446#
L$REV   002010 G        5446#
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L$SOFT  035760 G       10489#
L$SPC   002056 G        5446#
L$SPCP  002020 G        5446#
L$SPTP  002024 G        5446#
L$STA   002030 G        5446#
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L$TEST	002114	G	5446#				
L$TIML	002014	G	5446#				
L$UNIT	002012	G	5446#	7858			
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L10013	021062		7785#				
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L10020	021552		7945#				
L10021	021606		7964#				
L10022	021670		7998#				
L10023	021754		8023#				
L10024	022100		8061#				
L10025	022202		8088#				
L10026	022322		8120#				
L10027	022442		8156#				
L10030	022616		8197	8202#			
L10031	023052		8249	8256#			
L10032	023170		8290#				
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L10063	032010		9679#				
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L10066  032752          9857#
L10067  033664         10003#
L10070  034146         10104#
L10071  034346         10156#
L10072  034646         10224#
L10073  034736         10256#
L10074  035100         10309#
L10075  035246         10359#
L10076  035474         10429#
L10077  035560         10456   10463#
L10100  035760         10489   10492#
MAINT1= 000010          5608#
MAINT2= 000004          5609#
MCLK  = 000002          5704#   8441    8446    8461    8480    8484
MCLR  = 000100          5566#   6438    6439
MODR  = 000010          5678#
MPCSR   002446          5928#   7625    7631    7646    7666    7684    7705    7723    7742    7761    7867*   7902    7990
MPIVEC  002460          5934#   7876*
MPOVEC  002462          5935#   7877*   7878*
MPRIOR  002464          5936#   7879*
MSG1    003220          6336#   7506    7508    7511    9500    9504    9513    9544    9547    9556    9570    9624    9627
                        9638    9639    9646    9668    9707    9710    9719    9733    9770    9773    9784    9785    9792
                        9814    9892   10283
MSG4    003246          6348#  10395
MSTCLR  003576          6436#   6842    8012    8039    8073    8077    8100    8137    8174    8182    8218    8269    8303
                        8337    8371    8420    8492    8510    8526    8581    8647    8698    8745    8803    8859    8896
                        8930    8996    9149    9195    9255    9337    9344    9515    9534    9595    9614    9678    9697
                        9741    9760    9824    9839    9856    9879   10002   10032   10103   10155   10223   10255   10308
                       10358   10428
MVIOX = 021000          5861#   6466    8431
MVIXO = 122000          5862#   6488
MVIXOX= 121000          5863#   8141
NEWST   021242          7841    7850#   7859
OACT  = 000100          5651#   6803    6809    6870
OACTIV  005324          6793#   6845    6862    6877    6927    6963    9901    9905    9926    9943    9964    9980    9999
                       10423
OC    = 000200          5588#   5650#   6958    9996   10351
OCOR  = 000020          5701#   6690    6696    6882    9016
OP    = 000002          5784#   5786
ORDY  = 000020          5653#   6674    6680    8239    8240    9048
OSIRDY  004634          6664#   6843    6860    6887    6931    6937    6961    8931    8941    8997    9006    9021    9035
                        9053    9078    9094    9097    9893    9899    9915    9918    9928
OVRR  = 000010          5666#   7329    7331    7337
O$APTS= 000000          5406#   5446
O$AU  = 000001          5406#   5436#   5446
O$BGNR= 000000          5406#   5446
O$BGNS= 000000          5406#   5446
O$DU  = C00001          5406#   5436#   5446
O$ERRT= 000000          5406#   5446
O$GNSW= 000000          5406#   5446
O$POIN= 000001          5406#   5436#   5446
O$SETU= 000000          5406#   5446   10515
PATA    002571          5998#   8041
PATB    002615          6021#   8059    8228
PATC    002625          6032#   8271
```

```
PATCH   035760          10504#
PATD    002630           6038#  8288   8305
PATE    002633           6044#  8322   8339
PATF    002641           6053#  8356   8373
PATG    002644           6059#  8176   8390
PATH    002654           6070#  8180   8512
PATI    002664           6081#  8524   8528   8582   8667   8670   8898   8901
PATJ    002674           6092#  8562   8585   8589   8590
PATK    002704           6103#  8648   8746
PATL    003014           6177#  8678   8699   8775
PATM    003022           6186#  8014   8017   8079   8082   8111   8114   8147   8150   8184   8220   8728
PATN    003032           6197#  8200   8927
PATO    003050           6214#  8860   8965
PATP    003066           6231#  8861   8887
PATU    003104           6248#  8806
PATV    003152           6288#  8805   8839
PNT   = 001000 G         5549#
POLL  = 000200           5604#
PRI   = 002000 G         5549#
PRIOR   002350           5894#
PRIRTY  035637          10460   10467#
PRI00 = 000000 G         5549#
PRI01 = 000040 G         5549#
PRI02 = 000100 G         5549#
PRI03 = 000140 G         5549#
PRI04 = 000200 G         5549#
PRI05 = 000240 G         5549#
PRI06 = 000300 G         5549#
PRI07 = 000340 G         5549#  7899   7901   7987   7989
PSTACK  002346           5893#  6702   6815   7027   7068   7122   7350   7485   7819*
RAB   = 000004           5667#  7314   7316   7322
RABT  = 000004           5727#
RAX15   002370           5903#  6568*  6569*  6639   8539*  8540   8544   8599*  8600   8604   8658   8661   8709
                         8712   8756   8759   8816*  8817   8821   8945   8949   9061   9064   9084   9087   9560
                         9563   9575   9578   9589   9658   9661   9723   9726   9804   9807   9848   9851   9952
                         9955   9972   9988
RAX16   002372           5904#  6572*  6573*  6641   7096   7102   7110   7116   8551   8555   8610   8614   8667
                         8671   8718   8721   8765   8768   8827   8831   8873   8879   8898   8902   8955   8959
RCVBUF  003262           6360#  7509
RCV1ST  007406           7162#  10048  10141  10187  10339  10409
RDALL = 000004           5631#
RDAX  = 000020           5617#  5689#  6555
RDRXSI  007326           7138#  7249   7429   10248
READAX  004076           6549#  6638   7093   8529   8596   8657   8708   8755   8813   8872   8897   8944   9060
                         9083   9559   9574   9588   9657   9722   9803   9847
READLU  003644           6458#  6509   6559   6567   6571   6610   6671   6687   6800   6869   6881   6966   6996
                         7012   7053   7140   7144   7183   7261   7466   8013   8047   8078   8110   8146   8187
                         8235   8276   8310   8344   8378   9015   9047   9247   9290   9299   9311   9330   9338
READY = 000200           5686#  6560   6611
REDBYT  002364           5901#  6470*  6471*  6510   6560   6568   6572   6611   6674   6680   6690   6696   6803
                         6809   6870   6882   6967   6999   7005   7015   7021   7056   7062   7141   7145   7184
                         7262   7469   7475   8014   8018   8048*  8049   8052   8079   8083   8111   8115   8147
                         8151   8188*  8189   8193   8236*  8239*  8241   8245   8277*  8278   8281   8311*  8312
                         8315   8345*  8346   8349   8379*  8380   8383   8440*  8441   8447   8460*  8461   8466
                         8479*  8480   8485   9016   9048   9248   9291   9300   9312   9331   9339
REDDAT  002500           5944#  8219   8229*  8230*  8240*  8241   8244   8583   8591*  8592*  8600   8603   8610
```

```
                        8613
REGNUM  002400          5907#  6460   6486   6506   6508*  6512*  6513   6515*  6550   6552*  6566*  6570*  6574*
                        6588   6590*  6595*  6599*  6603*  6616*  6664   6670*  6686*  6701*  6707*  6744   6746*
                        6749*  6752*  6793   6799*  6814*  6820*  6838   6853*  6865*  6879*  6891*  6954   6957*
                        6965*  6973*  6989   6995*  7011*  7026*  7032*  7046   7052*  7067*  7073*  7138   7139*
                        7143*  7146*  7164   7167*  7199*  7215   7216*  7227*  7244   7260*  7268*  7274*  7349*
                        7354*  7369   7374*  7386*  7458   7463*  7490*  7633   7668   7685   7725   7744   7763
                        8011*  8040*  8074*  8101*  8138*  8139   8175*  8179*  8183*  8198*  8226*  8227*  8233*
                        8234*  8237   8270*  8304*  8338*  8372*  8428*  8518*  8532*  8862*  8933*  8936*  9012*
                        9043*  9223*  9246*  9289*  9540*  9620*  9703*  9766*  9840*  9885*  9889*  9992*  9995*
                       10350*
REG0    002510          5954#  8439*  8443*  8459*  8463*  8478*  8482*
REG1    002512          5955#
REG2    002514          5956#
REG3    002516          5957#
REG4    002520          5958#
REG5    002522          5959#
REG6    002524          5960#
REG7    002526          5961#
REQM  = 000002          5728#  7110   7116
RERR  = 000200          5722#
RETADR  002362          5900#  6703   6816   7028   7069   7123   7351   7486   8928*  8992*  9122*  9171*  9219*
                        9280*  9361*  9418*  9533*  9613*  9696*  9759*  9875*  10028*  10123*  10175*  10240*  10278*
                       10329*  10383*
RING  = 000200          5674#
ROMI  = 000002          5570#  6422   6424   6425   6532   6534
ROMO  = 000004          5569#  6422   6424   6425   6532   6534
ROR   = 000010          5726#
RRDYTO= 000001          5868#  6551   6564   8530
RSEQM   007054          7086#  7177   9634   9643   9650   9655   9672   9780   9789   9796   9801   9818   9922
                        9947   9968   9984
RSQM  = 000001          5729#  7096   7102
RTS   = 000040          5676#  6967   9248
RUN   = 000200          5565#  6439   6534   8105
RUNINH  002476          5941#  7881*  8422
RXABT = 002000          5818#
RXBCC = 000400          5820#  7513
RXCHAR  011046          7426#  10145  10149  10151  10153  10191  10195  10199  10203  10207  10211  10215  10219
                       10221
RXEBL = 001000          5819#
RXLEN0= 000001          5796#  7250   10135  10143  10193  10201  10209  10217
RXLEN1= 000002          5795#  7250   10139  10143  10193  10197  10209  10213
RXLEN2= 000004          5794#  7250   10135  10139  10143  10193  10197  10201  10205
RXOVR = 004000          5817#
RXWORD  002424          5917#  7141*  7142*  7145*  7253*  7254   7259   7275   7281   7286   7292   7301   7307
                        7316   7322   7331   7337
RX0   = 000001          5645#  5717#
RX1   = 000002          5644#  5716#
RX2   = 000004          5643#  5715#
RX3   = 000010          5642#  5714#
RX4   = 000020          5641#  5713#
RX5   = 000040          5640#  5712#
RX6   = 000100          5639#  5711#
RX7   = 000200          5638#  5710#
R14NRW  002560          5984#  8045   8048
SAVE4   002414          5913#  7827*  7830   7907   7996
```

```
SAVE6   002416          5914# 7828* 7831  7908  7997
SAVLEN  002432          5920# 6446* 7250  7383* 7824*
SCRACH  002342          5891#
SEC   = 000020          5771#
SECA  = 000020          5629#
SELFR = 000040          5606#
SELSBY= 000002          5610#
SEL4    002454          5932# 7872* 7873*
SEL6    002456          5933# 6423* 6533* 7874* 7875*
SETUP   010612          7368# 9535  9615  9698  9761  9880
SFPTBL  002302 G        5519#
SIGQ  = 000100          5699#
SIGR  = 000200          5698#
SOM   = 000001          5592#
STALL   005136          6731# 6775  6777  6868  6873  6886
STARES  002444          5925# 7847* 7852* 8424
STARST  021232          7835  7838  7846#
STBY  = 000002          5680#
STEPLU= 000020          5567# 6774  6776  6867  6872  6885
STEPMP= 000001          5571# 6424  6425
STPCLK  003540          6421# 6468  6492  8144
STPERR  007620          7215#
STPLU   005226          6765# 6933  7179  7222  7346  7436  7464  9013  9045  9081  9244  9287  9297
                        9309  9328  9507  9550  9554  9568  9583  9591  9630  9636  9666  9713  9717
                        9731  9776  9782  9812  9903  9924  9939  9960  9976  10063 10075 10091 10137
                        10246 10289 10353 10403
STR   = 000040          5770#
STRIP = 000010          5630# 9125  9222  9283  9324  9499  9537  9700  10041 10281 10388
SUBRPC  002352          5895# 6665  6666  6668* 6669* 6706* 6794  6795  6797* 6798* 6819* 6840* 6841*
                        6893* 6913* 6914* 6940* 6955* 6956* 6972* 6990  6991  6993* 6994* 7031* 7047
                        7048  7050* 7051* 7072* 7087  7088  7090* 7091* 7126* 7165* 7166* 7202* 7245*
                        7246* 7356* 7388* 7427* 7428* 7443* 7460* 7461* 7491* 7665  7704  7741  7820*
SVCGBL= 000000          5406# 5412  5420# 5446  5469  5491  5519  6383  6388  7624  7630  7645  7664
                        7683  7703  7722  7740  7760  7783  7799  7817  7897  7923  7940  7963  10456
                        10489 10515#
SVCINS= 000001          5406# 5417# 5446  5469  5491  5519  6383  6388  6678  6684  6694  6700  6807
                        6813  6971  7003  7009  7019  7025  7060  7066  7100  7106  7114  7120  7266
                        7271  7290  7296  7305  7311  7320  7326  7335  7341  7473  7479  7625  7626
                        7631  7632  7633  7634  7635  7636  7637  7638  7639  7646  7647  7648  7649
                        7650  7651  7652  7653  7654  7655  7656  7657  7658  7665  7666  7667  7668
                        7669  7670  7671  7672  7673  7674  7675  7676  7677  7684  7685  7686  7687
                        7688  7689  7690  7691  7692  7693  7694  7695  7696  7697  7704  7705  7706
                        7707  7708  7709  7710  7711  7712  7713  7714  7715  7716  7723  7724  7725
                        7726  7727  7728  7729  7730  7731  7732  7733  7734  7741  7742  7743  7744
                        7745  7746  7747  7748  7749  7750  7751  7752  7753  7754  7761  7762  7763
                        7764  7765  7766  7767  7768  7785  7834  7835  7837  7838  7840  7841  7843
                        7844  7860  7861  7883  7899  7906  7909  7926  7942  7944  7945  7964  7987
                        7995  7998  8021  8023  8043  8055  8057  8061  8086  8088  8104  8118  8120
                        8154  8156  8196  8197  8202  8248  8249  8256  8273  8284  8286  8290  8307
                        8318  8320  8324  8341  8352  8354  8358  8375  8386  8388  8392  8426  8450
                        8452  8469  8471  8488  8490  8493  8521  8522  8535  8536  8547  8548  8558
                        8559  8564  8607  8608  8617  8618  8625  8650  8664  8665  8674  8676  8680
                        8701  8715  8716  8724  8726  8730  8748  8762  8763  8771  8773  8777  8808
                        8824  8825  8834  8836  8841  8867  8869  8882  8884  8889  8893  8905  8907
                        8908  8929  8952  8953  8962  8963  8968  8969  9067  9068  9090  9091  9101
                        9150  9196  9252  9256  9295  9304  9316  9335  9343  9345  9401  9481  9516
```

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                      9566   9581   9596   9664   9679   9729   9742   9810   9825   9854   9857   9958  10003
                     10104  10156  10224  10256  10309  10359  10429  10456  10458  10459  10460  10461  10463
                     10489  10492  10515
SVCSUB= 000001         5406#  5419#  8867   8893   8929
SVCTAG= 000001         5406#  5421#  5505   5522   7626   7639   7658   7677   7697   7716   7734   7754   7768
                      7785   7883   7909   7926   7945   7964   7998   8023   8057   8061   8088   8120   8156
                      8202   8256   8286   8290   8320   8324   8354   8358   8388   8392   8493   8564   8625
                      8676   8680   8726   8730   8773   8777   8836   8841   8884   8889   8907   8908   8968
                      8969   9101   9150   9196   9256   9345   9401   9481   9516   9596   9679   9742   9825
                      9857  10003  10104  10156  10224  10256  10309  10359  10429  10463  10492
SVCTST= 000001         5406#  5418#  7985   8010   8038   8072   8099   8136   8173   8217   8268   8302   8336
                      8370   8419   8509   8580   8646   8697   8744   8802   8858   8926   8991   9121   9170
                      9218   9276   9360   9417   9496   9532   9612   9695   9758   9838   9874  10027  10122
                     10174  10239  10277  10328  10382
SW0    = 000002        5656#
SW1    = 000004        5655#
SW2    = 000010        5654#
SW3    = 000040        5652#
SYNCH  = 000226        5763#  9124   9221   9282   9323   9498   9536   9699  10040  10242  10331  10334  10343
                     10348
SYNPAT   035476       10384  10426  10431#
SYN0   = 000001        5762#
SYN1   = 000002        5761#
SYN2   = 000004        5760#
SYN3   = 000010        5759#
SYN4   = 000020        5758#
SYN5   = 000040        5757#
SYN6   = 000100        5756#
SYN7   = 000200        5755#
S$LSYM= 010000         5406#  5505#  5522#  7626#  7639#  7658#  7677#  7697#  7716#  7734#  7754#  7768#  7785#
                      7883#  7909#  7926#  7945#  7964#  7998#  8023#  8043#  8061#  8088#  8120#  8156#  8202#
                      8256#  8273#  8290#  8307#  8324#  8341#  8358#  8375#  8392#  8493#  8564#  8625#  8650#
                      8680#  8701#  8730#  8748#  8777#  8808#  8841#  8869#  8889#  8907#  8908#  8968#  8969#
                      9101#  9150#  9196#  9256#  9345#  9401#  9481#  9516#  9596#  9679#  9742#  9825#  9857#
                     10003# 10104# 10156# 10224# 10256# 10309# 10359# 10429# 10463# 10492#
TEOM   = 000002        5749#  9914   9937
TERR   = 000200        5746#
TEST   = 000001        5785#  8814
TESTMD= 000004         5703#
TIMFLG   002360        5899#
TMP0     002530        5964#  6630*  6633*  7648   7687   7707
TMP1     002532        5965#  6648*  6649*  7648   7687   7707
TMP2     002534        5966#
TMP3     002536        5967#
TMP4     002540        5968#
TMP5     002542        5969#
TMP6     002544        5970#
TMP7     002546        5971#
TSOM   = 000001        5750#
TSTCON   002474        5940#
TSTNUM   002442        5924#  8421*  8426
TXAB   = 000004        5748#
TXABT  = 002000        5806#
TXCHAR   006074        6911#  9126   9129   9132   9135   9138   9141   9144   9175   9178   9181   9184   9187
                      9190   9226   9229   9232   9235   9238   9241   9284   9325   9369   9372   9377   9382
                      9387   9390   9393   9396   9422   9425   9428   9435   9440   9445   9450   9455   9460
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                    9465   9470   9473   9476
TXDATA= 000040      5700#  7469   7475
TXEN  = 000100      5615#  5687#  9224   9886   9888
TXEOM = 001000      5807#  6343   6344   6345   6346   6352   6353   9133   9136   9139   9142   9145   9182
                    9185   9188   9191   9233   9236   9239   9242   9388   9391   9394   9397   9471   9474
                    9477   10099  10285  10397
TXGA  = 000010      5747#
TXGOA = 004000      5805#  10285
TXLEN0= 000040      5793#  7250   9367   9380   9433   9443   9453   9463
TXLEN1= 000100      5792#  7250   9375   9380   9438   9443   9458   9463
TXLEN2= 000200      5791#  7250   9367   9375   9380   9448   9453   9458   9463
TXSOM = 000400      5808#  6336   6337   6849   9002   9306   10389
TXWORD  002422      5916#  6745*  6747   6750   6849*  6850*  6915*  7406*  9002*  9027*  9075*  9306*  9502*
                    9545*  9625*  9708*  9771*  9844*  10043* 10065* 10095* 10099* 10128* 10180* 10244* 10285*
                    10334* 10389* 10397*
TX0   = 000001      5583#  5741#
TX1   = 000002      5582#  5740#
TX2   = 000004      5581#  5739#
TX3   = 000010      5580#  5738#
TX4   = 000020      5579#  5737#
TX5   = 000040      5578#  5736#
TX6   = 000100      5577#  5735#
TX7   = 000200      5576#  5734#
T$ARGC= 000001      5446#  7625#  7631#  7632#  7633#  7634#  7635#  7636#  7637#  7638#  7646#  7647#  7648#
                    7649#  7650#  7651#  7652#  7653#  7654#  7655#  7656#  7657#  7665#  7666#  7667#  7668#
                    7669#  7670#  7671#  7672#  7673#  7674#  7675#  7676#  7684#  7685#  7686#  7687#  7688#
                    7689#  7690#  7691#  7692#  7693#  7694#  7695#  7696#  7704#  7705#  7706#  7707#  7708#
                    7709#  7710#  7711#  7712#  7713#  7714#  7715#  7723#  7724#  7725#  7726#  7727#  7728#
                    7729#  7730#  7731#  7732#  7733#  7741#  7742#  7743#  7744#  7745#  7746#  7747#  7748#
                    7749#  7750#  7751#  7752#  7753#  7761#  7762#  7763#  7764#  7765#  7766#  7767#  7944#
                    8426#  8452#  8471#  8490#
T$CODE= 012032      10458# 10459# 10460# 10461#
T$ERRN= 000032      5406#  6678#  6684#  6694#  6700#  6807#  6813#  6971#  7003#  7009#  7019#  7025#  7060#
                    7066#  7100#  7106#  7114#  7120#  7266#  7271#  7290#  7296#  7305#  7311#  7320#  7326#
                    7335#  7341#  7473#  7479#  7995#  8021#  8055#  8086#  8118#  8154#  8196#  8248#  8284#
                    8318#  8352#  8386#  8450#  8469#  8488#  8521#  8535#  8547#  8558#  8607#  8617#  8664#
                    8674#  8715#  8724#  8762#  8771#  8824#  8834#  8882#  8905#  8952#  8962#  9067#  9090#
                    9252#  9295#  9304#  9316#  9335#  9343#  9566#  9581#  9664#  9729#  9810#  9854#  9958#
T$EXCP= 000000      10458# 10459# 10460# 10461#
T$FLAG= 000040      8197#  8249#  8522#  8536#  8548#  8559#  8608#  8618#  8665#  8716#  8763#  8825#  8953#
                    8963#  9068#  9091#
T$GMAN= 000000      5406#
T$HILI= 000007      10458# 10459# 10460# 10461#
T$LAST= 000001      5406#  10515#
T$LOLI= 000000      10458# 10459# 10460# 10461#
T$LSYM= 010000      5406#  5505   5522   7626   7639   7658   7677   7697   7716   7734   7754   7768   7785
                    7883   7909   7926   7945   7964   7998   8023   8061   8088   8120   8156   8202   8256
                    8290   8324   8358   8392   8493   8564   8625   8680   8730   8777   8841   8889   8907
                    8908   8968   8969   9101   9150   9196   9256   9345   9401   9481   9516   9596   9679
                    9742   9825   9857   10003  10104  10156  10224  10256  10309  10359  10429  10463  10492
T$LTNO= 000052      10515#
T$NEST= 177777      5406#  5412#  5491#  5505#  5519#  5522#  7624#  7626#  7630#  7639#  7645#  7658#  7664#
                    7677#  7683#  7697#  7703#  7716#  7722#  7734#  7740#  7754#  7760#  7768#  7783#  7785#
                    7799#  7803#  7817#  7883#  7897#  7909#  7923#  7926#  7940#  7945#  7963#  7964#  7985#
                    7998#  8010#  8023#  8038#  8043#  8057#  8061#  8072#  8088#  8099#  8120#  8136#  8156#
                    8173#  8202#  8217#  8256#  8268#  8273#  8286#  8290#  8302#  8307#  8320#  8324#  8336#
```

```
                    8341#  8354#  8358#  8370#  8375#  8388#  8392#  8419#  8493#  8509#  8564#  8580#  8625#
                    8646#  8650#  8676#  8680#  8697#  8701#  8726#  8730#  8744#  8748#  8773#  8777#  8802#
                    8808#  8836#  8841#  8858#  8867#  8869#  8884#  8889#  8893#  8907#  8908#  8926#  8929#
                    8968#  8969#  8991#  9101#  9121#  9150#  9170#  9196#  9218#  9256#  9276#  9345#  9360#
                    9401#  9417#  9481#  9496#  9516#  9532#  9596#  9612#  9679#  9695#  9742#  9758#  9825#
                    9838#  9857#  9874#  10003#  10027#  10104#  10122#  10156#  10174#  10224#  10239#  10256#  10277#
                   10309#  10328#  10359#  10382#  10429#  10456#  10463#  10489#  10492#  10513#
T$NS0 = 000000       5412#  10513
T$NS1 = 000005       5491#  5505  5519#  5522  7624#  7626  7630#  7639  7645#  7658  7664#  7677  7683#
                     7697  7703#  7716  7722#  7734  7740#  7754  7760#  7768  7783#  7785  7799#  7803
                     7817#  7883  7897#  7909  7923#  7926  7940#  7945  7963#  7964  7985#  7998  8010#
                     8023  8038#  8061  8072#  8088  8099#  8120  8136#  8156  8173#  8202  8217#  8256
                     8268#  8290  8302#  8324  8336#  8358  8370#  8392  8419#  8493  8509#  8564  8580#
                     8625  8646#  8680  8697#  8730  8744#  8777  8802#  8841  8858#  8908  8926#  8969
                     8991#  9101  9121#  9150  9170#  9196  9218#  9256  9276#  9345  9360#  9401  9417#
                     9481  9496#  9516  9532#  9596  9612#  9679  9695#  9742  9758#  9825  9838#  9857
                     9874#  10003  10027#  10104  10122#  10156  10174#  10224  10239#  10256  10277#  10309  10328#
                    10359  10382#  10429  10456#  10463  10489#  10492
T$NS2 = 000002       8043#  8057  8273#  8286  8307#  8320  8341#  8354  8375#  8388  8650#  8676  8701#
                     8726  8748#  8773  8808#  8836  8867#  8889  8893#  8907  8929#  8968
T$NS3 = 000003       8869#  8884
T$PTNU= 000000       5406#
T$SAVL= 177777       5406#
T$SEGL= 177777       5406#  8043#  8057#  8273#  8286#  8307#  8320#  8341#  8354#  8375#  8388#  8650#  8665
                     8676#  8701#  8716  8726#  8748#  8763  8773#  8808#  8825  8836#  8869#  8884#
T$SEK0= 010000       8043#  8057  8273#  8286  8307#  8320  8341#  8354  8375#  8388  8650#  8665  8676
                     8701#  8716  8726  8748#  8763  8773  8808#  8825  8836  8869#  8884
T$SUBN= 000000       5406#  7985#  8010#  8038#  8072#  8099#  8136#  8173#  8217#  8268#  8302#  8336#  8370#
                     8419#  8509#  8580#  8646#  8697#  8744#  8802#  8858#  8867#  8893#  8926#  8929#  8991#
                     9121#  9170#  9218#  9276#  9360#  9417#  9496#  9532#  9612#  9695#  9758#  9838#  9874#
                    10027#  10122#  10174#  10239#  10277#  10328#  10382#
T$TAGL= 177777       5406#
T$TAGN= 010101       5406#  5491#  5519#  7624#  7630#  7645#  7664#  7683#  7703#  7722#  7740#  7760#  7783#
                     7799#  7817#  7897#  7923#  7940#  7963#  7985#  8010#  8038#  8072#  8099#  8136#  8173#
                     8217#  8268#  8302#  8336#  8370#  8419#  8509#  8580#  8646#  8697#  8744#  8802#  8858#
                     8867#  8893#  8926#  8929#  8991#  9121#  9170#  9218#  9276#  9360#  9417#  9496#  9532#
                     9612#  9695#  9758#  9838#  9874#  10027#  10122#  10174#  10239#  10277#  10328#  10382#  10456#
                    10489#
T$TEMP= 000000       5469#  5505#  5522#  7626#  7639#  7658#  7677#  7697#  7716#  7734#  7754#  7768#  7785#
                     7803#  7883#  7909#  7926#  7945#  7964#  7998#  8023#  8057#  8061#  8088#  8120#  8156#
                     8197#  8202#  8249#  8256#  8286#  8290#  8320#  8324#  8354#  8358#  8388#  8392#  8493#
                     8522#  8536#  8548#  8559#  8564#  8608#  8618#  8625#  8665#  8676#  8680#  8716#  8726#
                     8730#  8763#  8773#  8777#  8825#  8836#  8841#  8884#  8889#  8907#  8908#  8953#  8963#
                     8968#  8969#  9068#  9091#  9101#  9150#  9196#  9256#  9345#  9401#  9481#  9516#  9596#
                     9679#  9742#  9825#  9857#  10003#  10104#  10156#  10224#  10256#  10309#  10359#  10429#  10458#
                    10459#  10460#  10461#  10463#  10492#  10513#
T$TEST= 000052       5406#  7985#  8010#  8038#  8072#  8099#  8136#  8173#  8217#  8268#  8302#  8336#  8370#
                     8419#  8509#  8580#  8646#  8697#  8744#  8802#  8858#  8867  8893  8926#  8929  8991#
                     9121#  9170#  9218#  9276#  9360#  9417#  9496#  9532#  9612#  9695#  9758#  9838#  9874#
                    10027#  10122#  10174#  10239#  10277#  10328#  10382#  10515
T$TSTM= 177777       5406#  6678  6684  6694  6700  6807  6813  6971  7003  7009  7019  7025  7060
                     7066  7100  7106  7114  7120  7266  7271  7290  7296  7305  7311  7320  7326
                     7335  7341  7473  7479  7625  7626  7631  7632  7633  7634  7635  7636  7637
                     7638  7639  7646  7647  7648  7649  7650  7651  7652  7653  7654  7655  7656
                     7657  7658  7665  7666  7667  7668  7669  7670  7671  7672  7673  7674  7675
                     7676  7677  7684  7685  7686  7687  7688  7689  7690  7691  7692  7693  7694
```

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                    7695    7696    7697    7704    7705    7706    7707    7708    7709    7710    7711    7712    7713
                    7714    7715    7716    7723    7724    7725    7726    7727    7728    7729    7730    7731    7732
                    7733    7734    7741    7742    7743    7744    7745    7746    7747    7748    7749    7750    7751
                    7752    7753    7754    7761    7762    7763    7764    7765    7766    7767    7768    7785    7834
                    7837    7840    7843    7860    7883    7899    7906    7909    7926    7942    7944    7945    7964
                    7987    7995    7998    8021    8023    8043    8055    8057    8061    8086    8088    8104    8118
                    8120    8154    8156    8196    8197    8202    8248    8249    8256    8273    8284    8286    8290
                    8307    8318    8320    8324    8341    8352    8354    8358    8375    8386    8388    8392    8426
                    8450    8452    8469    8471    8488    8490    8493    8521    8522    8535    8536    8547    8548
                    8558    8559    8564    8607    8608    8617    8618    8625    8650    8664    8665    8674    8676
                    8680    8701    8715    8716    8724    8726    8730    8748    8762    8763    8771    8773    8777
                    8808    8824    8825    8834    8836    8841    8867    8869    8882    8884    8889    8893    8905
                    8907    8908    8929    8952    8953    8962    8963    8968    8969    9067    9068    9090    9091
                    9101    9150    9196    9252    9256    9295    9304    9316    9335    9343    9345    9401    9481
                    9516    9566    9581    9596    9664    9679    9729    9742    9810    9825    9854    9857    9958
                   10003   10104   10156   10224   10256   10309   10359   10429
T$TSTS= 000001       5406#   7985#   8010#   8038#   8072#   8099#   8136#   8173#   8217#   8268#   8302#   8336#   8370#
                    8419#   8509#   8580#   8646#   8697#   8744#   8802#   8858#   8926#   8991#   9121#   9170#   9218#
                    9276#   9360#   9417#   9496#   9532#   9612#   9695#   9758#   9838#   9874#  10027#  10122#  10174#
                   10239#  10277#  10328#  10382#
T$$AU  = 010021      7963#   7964
T$$AUT= 010016       7897#   7909
T$$CLE= 010017       7923#   7926
T$$DU  = 010020      7940#   7945
T$$HAR= 010077      10456#  10463
T$$HW  = 010000      5491#   5505
T$$INI= 010015       7817#   7883
T$$MSG= 010012       7624#   7626    7630#   7639    7645#   7658    7664#   7677    7683#   7697    7703#   7716    7722#
                     7734    7740#   7754    7760#   7768
T$$PRO= 010014       7799#
T$$RPT= 010013       7783#   7785
T$$SEG= 010000       8043#   8057#   8273#   8286#   8307#   8320#   8341#   8354#   8375#   8388#   8650#   8665    8676#
                     8701#   8716    8726#   8748#   8763    8773#   8808#   8825    8836#   8869#   8884#
T$$SOF= 010100      10489#  10492
T$$SUB= 010051       8867#   8889    8893#   8907    8929#   8953    8963    8968
T$$SW  = 010001      5519#   5522
T$$TES= 010076       7985#   7998    8010#   8023    8038#   8061    8072#   8088    8099#   8120    8136#   8156    8173#
                     8197    8202    8217#   8249    8256    8268#   8290    8302#   8324    8336#   8358    8370#   8392
                     8419#   8493    8509#   8522    8536    8548    8559    8564    8580#   8608    8618    8625    8646#
                     8680    8697#   8730    8744#   8777    8802#   8841    8858#   8908    8926#   8969    8991#   9068
                     9091    9101    9121#   9150    9170#   9196    9218#   9256    9276#   9345    9360#   9401    9417#
                     9481    9496#   9516    9532#   9596    9612#   9679    9695#   9742    9758#   9825    9838#   9857
                     9874#  10003   10027#  10104   10122#  10156   10174#  10224   10239#  10256   10277#  10309   10328#
                    10359   10382#  10429
T1       021610 G    5469    7985#
T10      023172 G    5469    8302#
T11      023310 G    5469    8336#
T12      023426 G    5469    8370#
T13      023544 G    5469    8419#
T14      024174 G    5469    8509#
T15      024526 G    5469    8580#
T16      025016 G    5469    8646#
T17      025226 G    5469    8697#
T18      025432 G    5469    8744#
T19      025636 G    5469    8802#
T2       021672 G    5469    8010#
```

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T20     026066 G        5469    8858#
T20.1   026116          8867#
T20.2   026224          8893#
T21     026320 G        5469    8926#
T21.1   026332          8929#
T22     026572 G        5469    8991#
T23     027250 G        5469    9121#
T24     027370 G        5469    9170#
T25     027500 G        5469    9218#
T26     027674 G        5469    9276#
T27     030240 G        5469    9360#
T28     030450 G        5469    9417#
T29     031000 G        5469    9496#
T3      021756 G        5469    8038#
T30     031100 G        5469    9532#
T31     031450 G        5469    9612#
T32     032012 G        5469    9695#
T33     032262 G        5469    9758#
T34     032624 G        5469    9838#
T35     032754 G        5469    9874#
T36     033666 G        5469   10027#
T37     034150 G        5469   10122#
T38     034350 G        5469   10174#
T39     034650 G        5469   10239#
T4      022102 G        5469    8072#
T40     034740 G        5469   10277#
T41     035102 G        5469   10328#
T42     035250 G        5469   10382#
T5      022204 G        5469    8099#
T6      022324 G        5469    8136#
T7      022444 G        5469    8173#
T8      022620 G        5469    8217#
T9      023054 G        5469    8268#
UAM   = 000200 G        5549#
UNIT    002440          5923#
UNRR  = 000001          5657#   7262    9291    9300    9312    9331    9339
UPBITS  002550          5974#   8185    8230    8236    8277    8311    8345    8379
VECTOR  035606         10459   10466#
V35   = 000020          5782#   5786
WAIT50  005120          6717#   6859    6917    6960    7181    7410    7430    8940    9005    9029    9308    9506    9549
                        9629    9712    9775    9998   10132   10184   10288   10338   10400
WAX   = 000010          5618#   5690#   6606
WAX15   002374          5905#   6596*   6597    6848*   6850    7371*   7380*   8513*   8589*   8591    8652*   8654*   8658
                        8660    8703*   8705*   8709    8711    8750*   8752*   8756    8758    8810*   8814    9366*   9432*
                        9896*   9908*   9936*  10134*  10186*
WAX16   002376          5906#   6600*   6601    6851*   7372*   7382*   7383    8514*   8590*   8592    8653*   8655*   8704*
                        8706*   8718    8720    8751*   8753*   8765    8767    8811*   9367*   9375*   9380*   9385*   9433*
                        9438*   9443*   9448*   9453*   9458*   9463*   9468*   9897*   9909*   9914*   9937*  10135*  10139*
                       10143*  10147*  10189*  10193*  10197*  10201*  10205*  10209*  10213*  10217*
WRDYTO= 000002          5869#   6589    6615    8516
WRIBYT  002366          5902#   6490*   6491    6553*   6554*   6555*   6556*   6591*   6592*   6593*   6597*   6601*   6604*
                        6605*   6606*   6607*   6747*   6750*   6855*   6958*   7217*   7218*   7224*   7376*   8044*   8045*
                        8049    8051    8075*   8102*   8177*   8228*   8229    8274*   8278    8280    8308*   8312    8314
                        8342*   8346    8348    8376*   8380    8382    8870*   8894*   8934*   8937*   9224*   9542*   9622*
                        9674*   9705*   9737*   9768*   9820*   9841*   9886*   9890*   9993*   9996*  10351*
WRITAX  004264          6587#   6852    7373    7384    8515    8593    8656    8707    8754    8812    9368    9376    9381
```

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                    9386    9434    9439    9444    9449    9454    9459    9464    9469    9898    9917    9938   10136
                   10140   10144   10148   10190   10194   10198   10202   10206   10210   10214   10218
WRITLU  003722      6484#   6557    6594    6598    6602    6608    6748    6751    6856    6959    7219    7225    7377
                    8046    8076    8103    8178    8231    8275    8309    8343    8377    8871    8895    8935    8938
                    8939    9225    9543    9623    9675    9706    9738    9769    9821    9842    9887    9891    9994
                    9997   10352
XYZ    = 000100     5781#   5786
X$ALWA= 000000      5406#
X$FALS= 000040      5406#
X$OFFS= 000400      5406#
X$TRUE= 000020      5406#
$LSTIN= 000001      5415#
$LSTTA= 000001      5416#
.      = 036172     5398#   5886#   6360#   6388#   7618#   7948#   8197    8249    8522    8536    8548    8559    8608
                    8618    8665    8716    8763    8825    8953    8963    9068    9091   10505#
```

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BCOMPL    102#  5406#  7835  7838  7841  7844  7861
BERROR    110#  5406#
BGNAU     118#  5406#  7963
BGNAUT    132#  5406#  7897
BGNCLN    146#  5406#  7923
BGNDU     159#  5406#  7940
BGNHRD    172#  5406#  10456
BGNHW     187#  5406#  5491
BGNINI    203#  5406#  7817
BGNMOD    215#  5406#  5412
BGNMSG    232#  5406#  7624  7630  7645  7664  7683  7703  7722  7740  7760
BGNPRO    245#  5406#  7799
BGNPTA    259#  5406#
BGNRPT    297#  5406#  7783
BGNSEG    311#  5406#  8043  8273  8307  8341  8375  8650  8701  8748  8808  8869
BGNSET    325#  5406#
BGNSFT    352#  5406#  10489
BGNSRV    367#  5406#
BGNSUB    380#  5406#  8867  8893  8929
BGNSW     408#  5406#  5519
BGNTST    423#  5406#  7985  8010  8038  8072  8099  8136  8173  8217  8268  8302  8336  8370  8419
          8509  8580   8646  8697  8744  8802  8858  8926  8991  9121  9170  9218  9276  9360  9417
          9496  9532   9612  9695  9758  9838  9874  10027 10122 10174 10239 10277 10328 10382
BNCOMP    457#  5406#
BNERRO    465#  5406#
BREAK     473#  5406#
BRESET    481#  5406#  7942  8104
CKLOOP    491#  5406#
CLOCK     503#  5406#
CLOSE     514#  5406#
CLRVEC    528#  5406#
COMMEN    537#  5406#
DELAY     568#  5406#
DESCRI    558#  5406#  6388
DEVTYP    588#  5406#  6383
DISPAT    597#  5406#  5469
DISPLA    615#  5406#
DOCLN     635#  5406#
DODU      643#  5406#  7906
DORPT     651#  5406#
ENDAU     659#  5406#  7964
ENDAUT    675#  5406#  7909
ENDCLN    692#  5406#  7926
ENDCOM    708#  5406#
ENDDU     730#  5406#  7945
ENDHRD    749#  5406#  10463
ENDHW     765#  5406#  5505
ENDINI    779#  5406#  7883
ENDMOD    796#  5406#  10513
ENDMSG    813#  5406#  7626  7639  7658  7677  7697  7716  7734  7754  7768
ENDPRO    830#  5406#  7803
ENDPTA    844#  5406#
ENDRPT    857#  5406#  7785
ENDSEG    876#  5406#  8057  8286  8320  8354  8388  8676  8726  8773  8836  8884
ENDSET    895#  5406#
ENDSFT    915#  5406#  10492
```

```
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          7733#  7734#  7741#  7742#  7743#  7744#  7745#  7746#  7747#  7748#  7749#  7750#  7751#  7752#  7753#
          7754#  7761#  7762#  7763#  7764#  7765#  7766#  7767#  7768#  7785#  7834#  7837#  7840#  7843#  7860#
          7883#  7899#  7906#  7909#  7926#  7942#  7944#  7945#  7964#  7987#  7995  7998#  8021  8023#  8043#
          8055  8057#  8061#  8086  8088#  8104#  8118  8120#  8154  8156#  8196  8197#  8202#  8248  8249#
          8256#  8273#  8284  8286#  8290#  8307#  8318  8320#  8324#  8341#  8352  8354#  8358#  8375#  8386
          8388#  8392#  8426#  8450  8452#  8469  8471#  8488  8490#  8493#  8521  8522#  8535  8536#  8547
          8548#  8558  8559#  8564#  8607  8608#  8617  8618#  8625#  8650#  8664  8665#  8674  8676#  8680#
          8701#  8715  8716#  8724  8726#  8730#  8748#  8762  8763#  8771  8773#  8777#  8808#  8824  8825#
          8834  8836#  8841#  8867#  8869#  8882  8884#  8889#  8893#  8905  8907#  8908#  8929#  8952  8953#
          8962  8963#  8968#  8969#  9067  9068#  9090  9091#  9101#  9150#  9196#  9252  9256#  9295  9304
          9316  9335  9343  9345#  9401#  9481#  9516#  9566  9581  9596#  9664  9679#  9729  9742#  9810
          9825#  9854  9857#  9958  10003#  10104#  10156#  10224#  10256#  10309#  10359#  10429#
M$TLAB    2739#  5406#  6678#  6684#  6694#  6700#  6807#  6813#  6971#  7003#  7009#  7019#  7025#  7060#  7066#
```

```
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            7479#  7625#  7626#  7631#  7632#  7633#  7634#  7635#  7636#  7637#  7638#  7639#  7646#  7647#  7648#
            7649#  7650#  7651#  7652#  7653#  7654#  7655#  7656#  7657#  7658#  7665#  7666#  7667#  7668#  7669#
            7670#  7671#  7672#  7673#  7674#  7675#  7676#  7677#  7684#  7685#  7686#  7687#  7688#  7689#  7690#
            7691#  7692#  7693#  7694#  7695#  7696#  7697#  7704#  7705#  7706#  7707#  7708#  7709#  7710#  7711#
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            7754#  7761#  7762#  7763#  7764#  7765#  7766#  7767#  7768#  7785#  7834#  7837#  7840#  7843#  7860#
            7883#  7899#  7906#  7909#  7926#  7942#  7944#  7945#  7964#  7987#  7995#  7998#  8021#  8023#  8043#
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            8256#  8273#  8284#  8286#  8290#  8307#  8318#  8320#  8324#  8341#  8352#  8354#  8358#  8375#  8386#
            8388#  8392#  8426#  8450#  8452#  8469#  8471#  8488#  8490#  8493#  8521#  8522#  8535#  8536#  8547#
            8548#  8558#  8559#  8564#  8607#  8608#  8617#  8618#  8625#  8650#  8664#  8665#  8674#  8676#  8680#
            8701#  8715#  8716#  8724#  8726#  8730#  8748#  8762#  8763#  8771#  8773#  8777#  8808#  8824#  8825#
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            9316#  9335#  9343#  9345#  9401#  9481#  9516#  9566#  9581#  9596#  9664#  9679#  9729#  9742#  9810#
            9825#  9854#  9857#  9958#  10003#  10104#  10156#  10224#  10256#  10309#  10359#  10429#
M$TSTL      2728#  5406#  6678#  6684#  6694#  6700#  6807#  6813#  6971#  7003#  7009#  7019#  7025#  7060#  7066#
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M$WORD      2888#  5406#  5446#  5469#  6678#  6684#  6694#  6700#  6807#  6813#  6971#  7003#  7009#  7019#  7025#
            7060#  7066#  7100#  7106#  7114#  7120#  7266#  7271#  7290#  7296#  7305#  7311#  7320#  7326#  7335#
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            9581#  9664#  9729#  9810#  9854#  9958#  10458#  10459#  10460#  10461#  10515
M$XFER      2410#  5406#
OPEN        1694#  5406#
POINTE      1702#  5406#  5436
PRINTB      1768#  5406#  7625  7631  7632  7633  7634  7646  7647  7648  7649  7665  7666  7667  7668
            7684  7685  7686  7687  7688  7704  7705  7706  7707  7723  7724  7725  7741  7742  7743
            7744  7745  7761  7762  7763
PRINTF      1811#  5406#  7944  8426  8452  8471  8490
PRINTS      1854#  5406#
PRINTX      1897#  5406#  7635  7636  7637  7638  7650  7651  7652  7653  7654  7655  7656  7657  7669
            7670  7671  7672  7673  7674  7675  7676  7689  7690  7691  7692  7693  7694  7695  7696
            7708  7709  7710  7711  7712  7713  7714  7715  7726  7727  7728  7729  7730  7731  7732
            7733  7746  7747  7748  7749  7750  7751  7752  7753  7764  7765  7766  7767
READBU      1940#  5406#
```

```
READEF    1949#   5406#   7834    7837    7840    7843
RFLAGS    1967#   5406#
SETPRI    1977#   5406#   7899    7987
SETVEC    1986#   5406#
SLASH     1998#   5406#
STARS     2015#   5406#
SVC       2036#   5405#   5406
XFER      2299#   5406#
XFERF     2310#   5406#
XFERT     2319#   5406#


. ABS.  036172     000


 ERRORS DETECTED:  0

 SAIL:CZDMRA,CZDMRA/CRF/NL:TOC=CZDMP.MLB,CZDMRA.P11
 RUN-TIME: 145 173 13 SECONDS
 RUN-TIME RATIO: 876/332=2.6
 CORE USED:  18K  (35 PAGES)
```