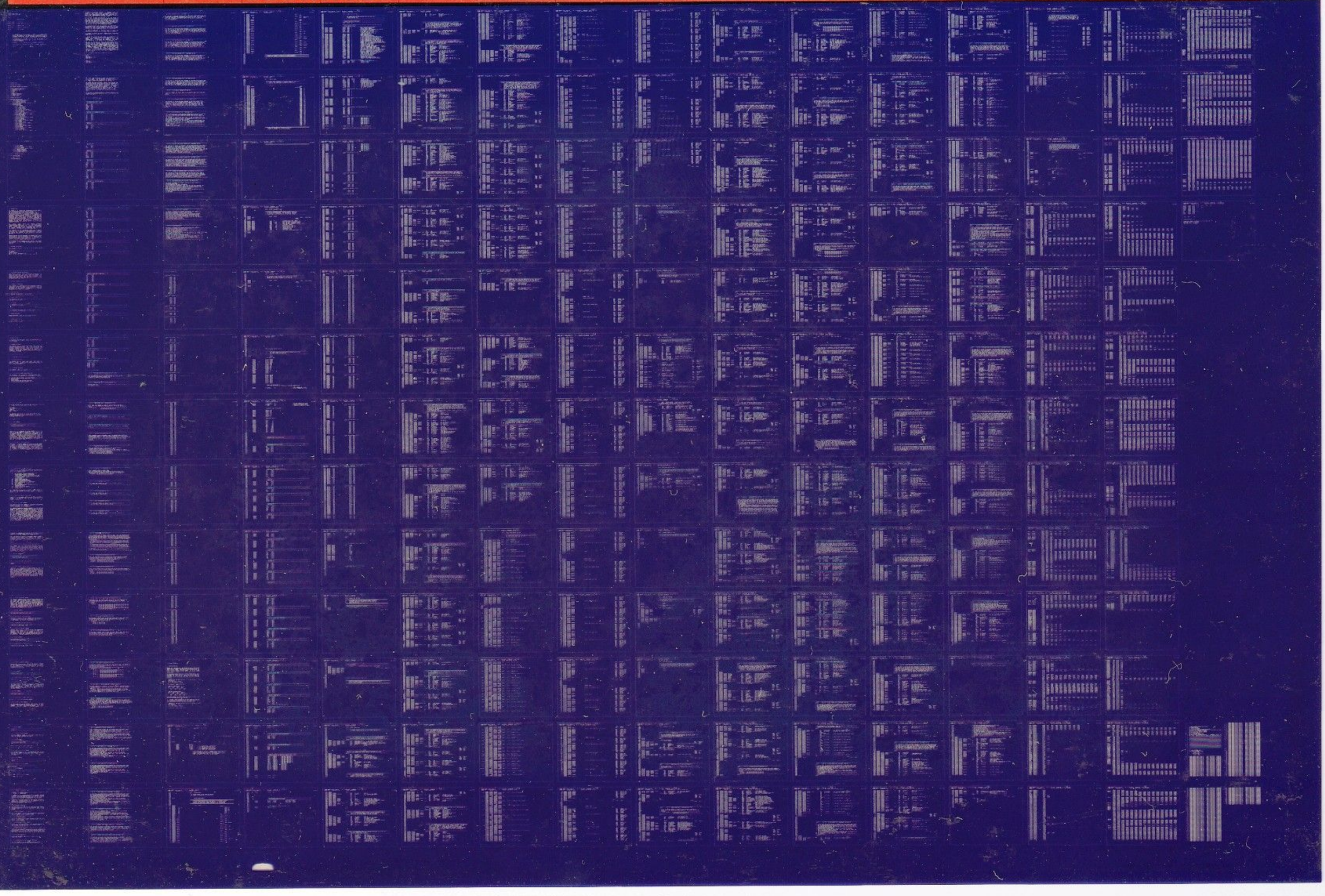
DMP11 DMR11 M8203 STATIC DIAG #1 AH-E232C-MC
CZDMRC0 FICHE 1 OF 1



```
.NLIST
.TITLE CZDMRC M8203 STATIC DIAG #1
.SBTTL PROGRAM DOCUMENT
.LIST

.REM @
```


IDENTIFICATION

PRODUCT CODE: AC-E231C-MC

PRODUCT NAME: CZDMRC0 M8203 STATIC DIAG #1

PRODUCT DATE: FEBRUARY 1980

MAINTAINER: DIAGNOSTIC ENGINEERING

AUTHOR: DAVID HOFFMAN

CONTENTS

1.0 INTRODUCTION

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

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

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

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

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

2.0 HARDWARE REQUIREMENTS

THE FOLLOWING HARDWARE IS REQUIRED TO RUN THE M8203 STATIC LOGIC TESTS:

PDP-11/04,05,10,20,30,34,35,40,45,50,60, OR 70
16K MEMORY
CONSOLE TERMINAL
DMC-11 OR KMC-11 MICROPROCESSOR
M8203 LINE UNIT AND BC08S-1 CABLE AND BERG CONNECTORS

3.0 PRELIMINARY PROGRAM REQUIREMENTS

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

4.0 GENERAL PROGRAM CONSIDERATIONS

4.1 DIAGNOSTIC SUPERVISOR

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

4.2 EXECUTION TIME

THE MAXIMUM TIME REQUIRED TO RUN THE M8203 STATIC LOGIC TESTS IS ABOUT 45 SECONDS PER PASS FOR EACH UNIT.

4.3 XXDP+

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

4.4 ACT/SLIDE

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

4.5 APT

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

4.6 MEMORY MANAGEMENT

MEMORY MANAGEMENT IS NOT UTILIZED IN THIS PROGRAM. IF IT IS INSTALLED, IT IS DISABLED BY THE PROGRAM.

4.7 MEMORY PARITY OPTION

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

4.8 ERROR LOGGING

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

5.0 PROGRAM LOAD MEDIA

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

6.0 OPERATING INSTRUCTIONS

6.1 LOADING AND STARTING PROCEDURES

6.1.1 LOADING PROCEDURES

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

6.1.2 STARTING PROCEDURES

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

6.1.3 STEPS FOR QUICK AND SIMPLE EXECUTION

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

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

6.2 INITIAL DIALOGUE

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

```
DRS LOADED
DIAG. RUN-TIME SERVICES
CZDMR-C-0
M8203 STATIC LOGIC TESTS - PART 1 OF 2
UNIT IS M8203
DR>
```

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

6.3 PROGRAM OPTIONS

6.3.1 START COMMAND

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

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

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

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

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

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

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

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

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

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

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

6.3.1.5 EFFECT OF START COMMAND

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

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

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

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

EXAMPLE:

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

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

6.3.2 RESTART COMMAND

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

6.3.2.1 TESTS, PASS, AND FLAGS SWITCHES

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

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

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

6.3.2.3 EFFECT OF RESTART COMMAND

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

6.3.3 CONTINUE COMMAND

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

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

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

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

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

6.3.3.3 EFFECT OF CONTINUE COMMAND

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

6.3.4 PROCEED COMMAND

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

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

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

6.3.4.2 EFFECT OF PROCEED COMMAND

PROCEED MUST FOLLOW A START, RESTART, 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 (SELO) RESIDE ON THE UNIBUS. THE ALLOWABLE RANGE IS 160000-177776 (OCTAL), AND THE DEFAULT VALUE IS 160170.

2. DEVICE VECTOR ADDRESS : (O) 300 ?

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

3. DEVICE PRIORITY LEVEL : (O) 5 ?

THIS IS THE CPU PRIORITY AT WHICH THE INTERRUPT HANDLERS OF THIS DEVICE WILL BE EXECUTED. THE ALLOWABLE RANGE IS 0-7, AND THE DEFAULT VALUE IS 5.

4. 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).

7.0 DEVICE INFORMATION TABLES

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

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

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

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

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

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

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

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

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

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

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

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

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

```
;*****************************************************************************                SEQ 0018
* AX0-15 - USYRT REG 0 (READ ONLY)
;*****************************************************************************
RX7     = BIT7
RX6     = BIT6
RX5     = BIT5
RX4     = BIT4
RX3     = BIT3
RX2     = BIT2
RX1     = BIT1
RX0     = BIT0

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

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

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

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

```
;*****************************************************************************                SEQ 0019
* AX2-16 - USYRT REG 5
;*****************************************************************************
APA     = BIT7
DDC     = BIT6
STR     = BIT5
SEC     = BIT4
IDL     = BIT3
CRCTY2  = BIT2
CRCTY1  = BIT1
CRCTY0  = BIT0

;*****************************************************************************
* AX3-15 - USYRT REG 6
;*****************************************************************************
I422    = BIT7
XYZ     = BIT6
C32BCC  = BIT5
V35     = BIT4
INTGRL  = BIT3
C32ENB  = BIT2
OP      = BIT1
TEST    = BIT0
AX315U  = I422!XYZ!C32BCC!V35!INTGRL!OP

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

8.0 TEST DESCRIPTIONS

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



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

```
;*****************************************************************************                SEQ 0020
    TEST 3 - INBUS/OUTBUS REG 14 READ/WRITE BIT TEST
*
* WRITE, READ, AND COMPARE ALL WORDS OF DATA PATTERN A INTO REG 14,
* A BYTE AT A TIME. NON-R/W BITS ARE MASKED OFF TO 0 BEFORE WRITING AND
* READING.
*    DATA PATTERN A = 125,252,000,377,001,002,004,010,020,040,100,200,376,
*                     375,373,367,357,337,277,177.
;*****************************************************************************



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



;*****************************************************************************
    TEST 5 - REG 14 UNIBUS RESET (INIT) TEST
* WRITE 377 INTO REG 14, ISSUE UNIBUS RESET (INIT), READ REG 14 AND COMPARE
* TO 200.
;*****************************************************************************



;*****************************************************************************
    TEST 6 - LINE UNIT FALSE SELECTION TEST
*
* FIRST, A MASTER CLEAR IS PERFORMED. THEN, THE PROGRAM SINGLE-STEPS THE
* MICROPROCESSOR THROUGH AN INSTRUCTION WHICH LOADS 041 (OCT) INTO THE MAR
* REGISTER (OBUS* ADRS 14). THEN, THE LINE UNIT REGISTER 14 IS READ AND CHECKED
* TO BE UNAFFECTED (STILL = 0). THIS TEST IS INTENDED TO DETECT A FALSE
* SELECTION OF THE LINE UNIT REGISTERS, WHEN THE LINE UNIT IS NOT BEING
* ACCESSED.
;*****************************************************************************



;*****************************************************************************
    TEST 7 - INBUS REG MASTER CLEAR TEST
*
* FIRST, ALL READ/WRITE BITS OF REGS 10-17 ARE SET BY LOADING A
* DIFFERENT WORD OF PATTERN G INTO EACH REG.  THEN,
* A MASTER CLEAR IS ISSUED AND EACH REG IS READ AND COMPARED TO A WORD OF
* PATTERN M, WHICH CONTAINS THE INITIALIZED STATES OF THE REGS. (UNPREDICTABLE
* BITS ARE MASKED OFF TO 0 BEFORE COMPARISON).
*   PATTERN G = 000,000,240,120,177,000,000,001
*   PATTERN M = 000,020,000,000,200,000,000,051
;*****************************************************************************
```

```
;*******************************************************************************
    TEST 8 - REGISTER 10-17 ADDRESSING TEST
*
* FIRST, A MASTER CLEAR IS ISSUED. THEN,
* WRITE A DIFFERENT WORD OF DATA PATTERN B INTO EACH OF REGS 10-17,
* AND AFTER EACH WRITE, READ AND COMPARE ALL REGS TO EXPECTED VALUES.
* UNPREDICTABLE BITS ARE MASKED OFF TO 0 WHEN READ FOR COMPARISON.
*    PATTERN B = 000,000,040,100,220,000,000,051
;*******************************************************************************




;*******************************************************************************
    TEST 9 - REG 11 READ/WRITE BIT TEST
*
* WRITE, READ, AND COMPARE EACH WORD OF DATA PATTERN C INTO REG 11 :
*     DATA PATTERN C = 020,020,020.
;*******************************************************************************




;*******************************************************************************
    TEST 10 - REG 12 READ/WRITE BIT TEST
*
* WRITE, READ, AND COMPARE EACH WORD OF DATA PATTERN D INTO REG 12 :
*     DATA PATTERN D = 000,040,000.
;*******************************************************************************




;*******************************************************************************
    TEST 11 - REG 13 READ/WRITE BIT TEST
*
* WRITE, READ, AND COMPARE EACH WORD OF DATA PATTERN E INTO REG 13 :
*     DATA PATTERN E = 000,120,020,100,120,000.
;*******************************************************************************




;*******************************************************************************
    TEST 12 - REG 17 READ/WRITE BIT TEST
*
* WRITE, READ, AND COMPARE EACH WORD OF DATA PATTERN F INTO REG 17 :
*     DATA PATTERN F = 050,051,050.
;*******************************************************************************
```

```
;*****************************************************************************
    TEST 13 - MAINTENANCE CLOCK BIT TEST
*
* FIRST, A MASTER CLEAR IS ISSUED TO INIT ALL REGS. THEN, THE MICROPROCESSOR
* IS PLACED IN A LOOP ON AN INSTRUCTION, BY SETTING THE INSTRUCTION IN SEL6
* AND SETTING ROMI AND RUN IN BSEL1. THE INSTRUCTION IS ONE WHICH REPETITIVELY
* READS LINE UNIT REG 17 INTO BSEL2. THE PDP-11 CAN THEN SCAN BSEL2 TO MONITOR
* THE MAINTENANCE CLOCK BIT, MCLK. THE FOLLOWING SEQUENCE IS THEN PERFORMED
* TO MONITOR MCLK :
* - THE PROGRAM REPEATEDLY CHECKS THE MCLK BIT FOR THE 1 STATE, AND IF IT IS
*   NOT FOUND WITHIN SEVERAL HUNDRED MILLI-SEC (DEPENDING ON THE PROCESSOR)
*   AN ERROR IS REPORTED. (THE MAINTENANCE CLOCK HAS A PERIOD OF 41.6 MICRO-
*   SEC).
* - THE PROGRAM NEXT REPEATEDLY CHECKS THE MCLK BIT FOR THE 0 STATE, AND IF
*   IT IS NOT FOUND WITHIN SEVERAL HUNDRED MILLI-SEC AN ERROR IS REPORTED.
* - THE PROGRAM NEXT REPEATEDLY CHECKS MCLK BIT FOR THE 1 STATE AGAIN, AND
*   IF IT IS NOT FOUND WITHIN SEVERAL HUNDRED MILLI-SEC, AN ERROR IS REPORTED.
*
* IF THE P-TABLE FOR THIS UNIT INDICATES THAT THE MICROPROCESSOR RUN SWITCH
* IS OFF, THE TEST WILL BE SKIPPED.
;*****************************************************************************



;*****************************************************************************
    TEST 14 - EXTENDED REGISTER MASTER CLEAR TEST
*
* FIRST, ALL READ/WRITE BITS OF EXTENDED REGS AX0-AX3 ARE SET BY LOADING
* A DIFFERENT WORD OF PATTERN H INTO EACH REG. THEN, A MASTER CLEAR IS
* ISSUED AND EACH REG IS READ AND COMPARED TO A WORD OF PATTERN I, WHICH
* CONTAINS THE INITIALIZED STATES OF ALL THE EXTENDED REGS.
*    PATTERN H = 000,000,377,017,377,377,375,377
*    PATTERN I = 000,000,000,000,000,103,000,000
;*****************************************************************************



;*****************************************************************************
    TEST 15 - EXTENDED REGISTER ADDRESSING TEST
*
* FIRST, ISSUE A MASTER CLEAR TO PUT REGS INTO INITIALIZED STATES SHOWN IN
* PATTERN I. THEN, WRITE A DIFFERENT WORD OF PATTERN J INTO EACH EXTENDED (AX)
* REG, AND AFTER EACH WRITE, READ AND COMPARE ALL EXTENDED REGS TO EXPECTED
* VALUES.
*   PATTERN I = 000,000,000,000,000,103,000,000
*   PATTERN J = 000,000,001,002,004,103,040,100
;*****************************************************************************
```

```
;*****************************************************************************
    TEST 16 - REGS 15,16 / AX2-15,AX2-16 READ/WRITE BIT TEST
*
* USING REGS 15,16, THE INDIRECT REGS AX2-15,AX2-16 (USYRT REGS 4,5) ARE
* WRITTEN AND READ USING EACH WORD OF PATTERN K. AX2-15 IS COMPARED
* TO THE WORD WRITTEN, AND AX2-16 IS ALWAYS COMPARED TO 103. (AX2-16 IS NOT
* WRITEABLE).
*    PATTERN K =
*      FOR REG 15: 000,377,125,252,001,002,004,010,020,040,100,200,000,000,
*                  000,000,000,000,000,000,376,375,373,367,357,337,277,177,
*                  377,377,377,377,377,377,377,377
*      FOR REG 16: 000,377,125,252,000,000,000,000,000,000,000,000,001,002,
*                  004,010,020,040,100,200,377,377,377,377,377,377,377,377,
*                  376,375,373,367,357,337,277,177.
;*****************************************************************************




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



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

```
;*************************************************************************************** SEQ 0024
    TEST 19 - AX3-15,AX3-16 READ/WRITE BIT TEST
*
* IN THIS TEST A MASTER CLEAR IS DONE AND THEN A WRITE, READ, AND COMPARE ARE
* PERFORMED IN REGS AX3-15,AX3-16 USING EACH WORD OF PATTERN V FOR WRITING,
* AND PATTERN U FOR COMPARING.
* ANY BITS IN AX3-15,AX3-16 WHICH ARE NOT READ/WRITE ARE MASKED OFF (TO 0)
* IN THE EXPECTED VALUE BEFORE COMPARISON.
*   PATTERN V =
*       FOR REG 15 : 000,333,331,323,313,233,133,000,000,000,000,
*                    000,000,000,000,000,000,000,000
*       FOR REG 16 : 000,000,000,000,000,000,000,001,002,004,040,
*                    100,200,346,345,343,307,247,147
*   PATTERN U =
*       FOR REG 15 : 000,001,013,011,021,101,301,000,000,000,000,
*                    000,000,000,000,000,000,000,000
*       FOR REG 16 : 000,000,000,000,000,000,000,001,002,004,040,
*                    100,200,346,345,343,307,247,147
;***************************************************************************************



;***************************************************************************************
    TEST 20 - REG 17 - AX2-16 READ/WRITE, MASTER CLEAR TEST
*
* THIS TEST CONSISTS OF 2 SUBTESTS. IN THE FIRST SUBTEST, EACH BYTE OF PAT O
* IS WRITTEN INTO REG 17 AND AFTER EACH WRITE, AX2-16 IS READ AND COMPARED
* TO A BYTE OF PAT P.
*   PATTERN O = 000,041,004,010,020,040,100,101,200,201,300,111,301,375
*   PATTERN P = 000,113,200,040,020,010,001,104,007,105,007,144,107,157
* IN THE SECOND SUBTEST, REG 17 IS LOADED WITH 375, A MASTER CLEAR IS ISSUED,
* AND AX2-16 IS COMPARED TO ITS INITIALIZED STATE (103).
;***************************************************************************************



;***************************************************************************************
    TEST 21 - TRANSMITTER BUFFER DATA TEST
* A MASTER CLEAR IS DONE FIRST, AND THEN A BYTE OF PATTERN N IS LOADED INTO
* REG 11 AND THE NEXT BYTE IS LOADED TWICE INTO REG 10. THE PROGRAM THEN WAITS
* AT LEAST 50 MICRO-SEC, AND THEN IT READS AND COMPARES AX1-15 TO THE BYTE WHICH
* WAS LOADED INTO REG 10, AND IT READS AND COMPARES AX1-16 TO THE BYTE WHICH WAS
* LOADED INTO REG 11. THIS PROCESS IS REPEATED (INCLUDING THE MASTER CLEAR)
* FOR EACH PAIR OF BYTES IN PATTERN N.
*   PATTERN N =
*     FOR REG 10: 000,125,252,377,000,000,000
*     FOR REG 11: 000,000,000,000,005,012,017
;***************************************************************************************
```

SEQ 0025

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




;*****************************************************************************
    TEST 23 - TX MSG TIMING TEST, CHAR MODE, WITH CRC
*
* IN THIS TEST, AN ENTIRE MESSAGE IS TRANSMITTED (USING STEPLU AND LULOOP)
* AND THE PROGRAM MONITORS THE OCCURRENCE OF USYRT TX BUFFER EMPTY FLAGS
* (BY SCANNING ORDY AND OCOR) AND OACT, AT EACH STEP. THE TEST IS DONE IN
* CHARACTER ORIENTED PROTOCOL MODE, USING 8-BIT CHARS AND CRC-16.
* THE FOLLOWING STEPS ARE DONE:
* A MASTER CLEAR IS DONE, AND THE LINE UNIT IS PLACED IN CHAR MODE.
* SOM IS SET TWICE TO SEND 2 SYNCH CHARS. THEN, 2 000 CHARS ARE SENT, AND
* THEN 2 TERMINATING SYNCHS ARE SENT.
* THE TRANSMITTER IS THEN DISABLED, USING OC, AND OACT IS MONITORED FOR THE
* CLEARED STATE AFTER THE 3RD SYNCH COMPLETES.
;*****************************************************************************
```

```
;*****************************************************************************
    TEST 24 - TX MSG TIMING TEST, BIT MODE, WITH CRC
*
* IN THIS TEST, AN ENTIRE MESSAGE IS TRANSMITTED (USING STEPLU AND LULOOP)
* AND THE PROGRAM MONITORS THE OCCURRENCE OF USYRT TX BUFFER EMPTY FLAGS
* (BY SCANNING ORDY AND OCOR) AND OACT, AT EACH STEP. THE TEST IS DONE IN
* BIT ORIENTED PROTOCOL MODE, USING 8-BIT CHARS AND CRC-CCITT-1.
* THE FOLLOWING STEPS ARE DONE:
* A MASTER CLEAR IS DONE, AND THE LINE UNIT IS PLACED IN BIT MODE.
* SOM IS SET TWICE TO SEND 2 FLAG CHARS. THEN, 2 000 CHARS ARE SENT, AND
* THEN 2 TERMINATING FLAGS ARE SENT.
* THE TRANSMITTER IS THEN DISABLED, USING OC, AND OACT IS MONITORED FOR THE
* CLEARED STATE.
;*****************************************************************************
```

```
;*****************************************************************************                SEQ 0026
    TEST 25 - TX MSG TIMING TEST, CHAR MODE, WITH NO CRC
*
* IN THIS TEST, AN ENTIRE MESSAGE IS TRANSMITTED (USING STEPLU AND LULOOP)
* AND THE PROGRAM MONITORS THE OCCURRENCE OF USYRT TX BUFFER EMPTY FLAGS
* (BY SCANNING ORDY AND OCOR) AND OACT, AT EACH STEP. THE TEST IS DONE IN
* CHARACTER ORIENTED PROTOCOL MODE, USING 8-BIT CHARS AND NO ERROR CHECKING.
* THE FOLLOWING STEPS ARE DONE:
* A MASTER CLEAR IS DONE, AND THE LINE UNIT IS PLACED IN CHAR MODE.
* SOM IS SET TWICE TO SEND 2 SYNCH CHARS. THEN, 2 000 CHARS ARE SENT, AND
* THEN 2 TERMINATING SYNCHS ARE SENT.
* THE TEST IS PERFORMED WITH TXEN (REG 14, BIT6) SET, AND THE PROGRAM CHECKS
* THAT THIS HOLDS RTS HIGH PAST THE END OF THE MESSAGE.
* THE TRANSMITTER IS THEN DISABLED, USING OC, AND OACT IS MONITORED FOR THE
* CLEARED STATE.
;*****************************************************************************



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



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



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

SEQ 0027

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



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



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



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

```
;*****************************************************************************************  SEQ 0028
    TEST 33 - USYRT RECEIVER MSG TEST - BIT MODE, NO CRC
*
* THE LINE UNIT IS INITIALIZED AND A MESSAGE IS INITIATED (USING STEPLU) WITH
* LULP (REG 12) SET TO LOOP THE DATA INTERNALLY IN THE USYRT, AND WITH ERROR
* DETECTION INHIBITED. TWO FLAGS, 000,125,252,377,000, AND TWO TERMINATING FLAGS
* ARE THEN SENT. THE PROGRAM MONITORS IACT, RSOM, AND THE RCV'D CHARS ARE
* READ FROM AX0-15 AND COMPARED TO EXPECTED VALUES. THE PROGRAM THEN CHECKS FOR
* IACT = 0, SETS IC TO CLEAR THE RECEIVER, AND CHECKS FOR IACT STILL = 0.
;*****************************************************************************************



;*****************************************************************************************
    TEST 34 - SILO-DISABLED TRANSMITTER LOAD TEST
*
* THIS TEST DISABLES THE SILOS, LOADS A 125 CHARACTER INTO THE TX SILO, AND
* READS AX1-15 AND CHECKS THAT THE DATA DID NOT GET LOADED INTO THE USYRT TX
* BUFFER.
;*****************************************************************************************



;*****************************************************************************************
    TEST 35 - SILO-DISABLED MESSAGE TEST - BIT MODE, NO CRC
*
* THE LINE UNIT IS INITIALIZED AND A MESSAGE IS INITIATED (USING STEPLU)
* WITH LULP (REG 12) SET TO LOOP THE DATA INTERNALLY IN THE USYRT, WITH SILO
* DISABLE SET, AND WITH NO ERROR DETECTION. TWO FLAGS, 000,125,252, AND
* TERMINATING FLAGS ARE THEN SENT BY LOADING THE TRANSMITTED CHARS INTO
* REG AX1. THE PROGRAM MONITORS OACT, IACT, RSOM, REOM, ORDY, OCOR, ICIR,
* IRDY, AND THE RECEIVED CHARS ARE READ FROM AX0 AND COMPARED TO EXPECTED
* VALUES.
;*****************************************************************************************



;*****************************************************************************************
    TEST 36 - RECEIVER BUFFER TEST - CHAR MODE, CRC
*
* FIRST, A MASTER CLEAR IS DONE AND THE PROGRAM CHECKS FOR ICIR = 1 AND IRDY
* = 0. THEN, 2 SOM CHARS ARE LOADED AND CLOCKED INTO THE USYRT, AND 64
* BYTES OF A 256-BYTE BINARY COUNT DATA PATTERN (000-377) ARE LOADED INTO
* THE TX SILO.
* THE LINE UNIT IS THEN CLOCKED UNTIL IRDY = 1, AND THE PROGRAM CHECKS FOR
* THIS TO OCCUR WITHIN 40-43 CYCLES. THE PROGRAM READS THE RCV SILO, CHECKS THE
* CHAR FOR 000, AND CHECKS FOR IRDY = 0 AGAIN.
* THE LINE UNIT IS THEN CLOCKED IN GROUPS OF 8 CYCLES, AND AFTER EACH, THE
* PROGRAM CHECKS FOR ICIR = 1, IRDY = 1, UNTIL THE 64TH GROUP, AFTER WHICH
* IT CHECKS FOR ICIR = 0, IRDY = 1. THE SECOND DATA CHAR IS READ FROM THE
* RECEIVER SILO AND COMPARED TO 001. THEN, THE PROGRAM CHECKS FOR ICIR = 1,
* IRDY = 1 AGAIN.
* THE REST OF THE BINARY COUNT DATA BYTES ARE CYCLED 8 CLOCKS AND READ AND
* COMPARED A BYTE AT A TIME.
;*****************************************************************************************
```

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


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


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

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


;*****************************************************************************
    TEST 40 - MSG TERMINATION WITH GA CHARS - BIT MODE,NO CRC
*
* THE DEVICE IS ENABLED FOR TRANSMIT AND RECEIVE, AND A MESSAGE IS
* INITIATED IN BIT MODE.
* 2 FLAG CHARACTERS ARE SENT, FOLLOWED BY
* THE FOLLOWING DATA CHARACTERS : 000, 125, 252, 377, 000. THEN THE LOOP
* MODE BIT (STRIP) IS SET AND 2 TERMINATING GO-AHEAD CHARACTERS ARE
* SENT. EACH USYRT RCV FLAG IS TIMED AS IT IS RECEIVED, AND THE 5 DATA
* WORDS ARE READ AND COMPARED TO EXPECTED VALUES.
* ALSO, THE FIRST GA CHAR IS CHECKED BY SCANNING THE TXDATA BIT AS THE GA
* IS BEING TRANSMITTED (GA = 376 OCTAL).
* THE TEST ALSO CHECKS FOR SETTING OF RAB AND EBLK
* IN LOOP MODE.
;*****************************************************************************
```

SEQ 0030

```
;*************************************************************************
    TEST 41 - IDLE SYNCHS TEST - CHAR MODE
*
* THE DEVICE IS ENABLED FOR TRANSMIT AND RECEIVE, AND A MESSAGE IS
* INITIATED IN CHAR MODE. 24(DEC) SYNCHS ARE SENT.
* EACH SYNCH IS TIMED AS IT IS RECEIVED, AND THE BITS ARE CHECKED
* FOR A VALID SYNCH CHAR FOR EACH OF THE 22 SYNCHS WHICH FOLLOW
* THE FIRST TWO (THESE PERFORM SYNCHRONIZATION, AND ARE NOT READ).
* WHILE THE LAST SYNCH IS BEING TRANSMITTED, OC IS SET, AND THE
* NEXT CHAR RCV'D AFTER THE SYNCH IS CHECKED TO BE 377 (LINE MARKING).
* THEN, A MASTER CLEAR IS ISSUED.
* THE SYNCH CHAR USED IS 226 (OCTAL).
;*************************************************************************




;*************************************************************************
    TEST 42 - STRIP SYNCH TEST
*
* THE DEVICE IS ENABLED FOR TRANSMIT AND RECEIVE, AND A MESSAGE IS
* INITIATED IN CHAR MODE AND WITH THE STRIP SYNCH
* BIT SET. THEN 24 (DEC) SYNCHS ARE SENT
* FOLLOWED BY THE FOLLOWING DATA CHARACTERS : 377, 000, 125, 252,
* AND THEN 2 TERMINATING SYNCHS.
* EACH OF THE 23 SYNCHS AFTER THE FIRST ARE CHECKED AT THE TRANSMITTER OUTPUT,
* BY SCANNING THE TXDATA BIT.
* EACH USYRT RCV FLAG IS TIMED AS IT IS RECEIVED, AND THE 4 DATA WORDS
* ARE READ AND COMPARED TO EXPECTED VALUES.
* FINALLY, THE LINE UNIT IS CLOCKED FOR SEVERAL CHAR TIMES, AND A CHECK
* IS MADE FOR OACT = 0 (TEOM SHOULD CAUSE TX ENABLE TO DROP).
* THE ABOVE TEST IS REPEATED FOR EACH OF THE FOLLOWING SYNCH CHAR DATA
* PATTERNS : 226,000,125,252,376,177.
;*************************************************************************
```

8.1 DATA PATTERNS USED

SEQ 0031

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

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

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

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

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

```
***** DATA PATTERN F *****
PATF:
        .BYTE   050
        .BYTE   051
        .BYTE   050

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

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

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

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

SEQ 0033

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

```
        .BYTE   377
        .BYTE   375
        .BYTE   377
        .BYTE   373
        .BYTE   377
        .BYTE   367
        .BYTE   377
        .BYTE   357
        .BYTE   377
        .BYTE   337
        .BYTE   377
        .BYTE   277
        .BYTE   377
        .BYTE   177

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

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

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

```
***** DATA PATTERN O *****                                        SEQ 0035
PATO:
        .BYTE   000
        .BYTE   041
        .BYTE   004
        .BYTE   010
        .BYTE   020
        .BYTE   040
        .BYTE   100
        .BYTE   101
        .BYTE   200
        .BYTE   201
        .BYTE   300
        .BYTE   111
        .BYTE   301
        .BYTE   375

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

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

```
        .BYTE   000
        .BYTE   200
        .BYTE   000
        .BYTE   346
        .BYTE   000
        .BYTE   345
        .BYTE   000
        .BYTE   343
        .BYTE   000
        .BYTE   307
        .BYTE   000
        .BYTE   247
        .BYTE   000
        .BYTE   147

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

9.0 ERROR INFORMATION

9.1 ERROR REPORTING

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
```

@

```
2194                                .TITLE CZDMRC M8203 STATIC DIAG #1
2203          002000                .=2000
2204
2205
2206
2207
2208
2209
2210                                .MCALL  SVC
2211  002000                        SVC                                   ; INITIALIZE SUPERVISOR MACROS
2212
2213
2214
2215
2216
2217  002000                        BGNMOD  LU1MOD
2218
2219
2220          000001                $LSTIN= 1
2221          000001                $LSTTAG= 1
2222          000001                SVCINS= 1       ; LIST INSTRUCTIONS, SHIFTED RIGHT
2223          000001                SVCTST= 1       ; LIST TEST TAGS, SHIFTED RIGHT
2224          000001                SVCSUB= 1       ; LIST SUBTEST TAGS, SHIFTED RIGHT
2225          000001                SVCGBL= 1       ; LIST GLOBAL TAGS, SHIFTED RIGHT
2226          000001                SVCTAG= 1       ; LIST OTHER TAGS, SHIFTED RIGHT
2227
2228                                ;       CHANGE THE VALUES OF THE SVC... SYMBOLS TO BE ZERO IF YOU WISH
2229                                ;       TO ALIGN THE MACRO CALLS AND THEIR EXPANSIONS.  CHANGE THE
2230                                ;       SYMBOLS TO BE MINUS-ONE TO NOT LIST THE EXPANSIONS.  YOU MAY
2231                                ;       CHANGE THE SYMBOLS AT ANY POINT IN YOUR PROGRAM.
2232
2233
```

```
                                 .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,C,0,45.,0
  (4) 002000
  (4) 002000      103                                                        L$NAME::
                                                                                     .ASCII /C/
  (4) 002001      132                                                                .ASCII /Z/
  (4) 002002      104                                                                .ASCII /D/
  (4) 002003      115                                                                .ASCII /M/
  (4) 002004      122                                                                .ASCII /R/
  (6) 002005      000                                                                .BYTE   0
  (6) 002006      000                                                                .BYTE   0
  (5) 002007      000                                                                .BYTE   0
  (5) 002010                                                                 L$REV::
  (4) 002010      103                                                                .ASCII  /C/
  (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   035556                                                                .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   036234                                                                .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$DISPATCH
  (5) 002042                                                                 L$PRIO::
  (4) 002042   000000                                                                .WORD   0
  (5) 002044                                                                 L$ENVI::
  (4) 002044   000000                                                                .WORD   0
```

```
(5)  002046                                   L$EXP1::
(4)  002046  000000                                   .WORD   0
(5)  002050                                   L$MREV::
(4)  002050     003                                   .BYTE   C$REVISION
(3)  002051     003                                   .BYTE   C$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  021634                                   .WORD   L$AU
(5)  002072                                   L$DUT::
(4)  002072  021552                                   .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  021120                                   .WORD   L$INIT
(5)  002106                                   L$CCP::
(4)  002106  021550                                   .WORD   L$CLEAN
(5)  002110                                   L$ACP::
(4)  002110  021470                                   .WORD   L$AUTO
(5)  002112                                   L$PRT::
(4)  002112  021112                                   .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
```

```
2267                                    .SBTTL  DISPATCH TABLE
2268
2269                                    ;//////////////////////////////////////////////////////////////////////////////
2270                                    ;/ THE DISPATCH TABLE CONTAINS THE STARTING ADDRESS OF EACH TEST.
2271                                    ;/ IT IS USED BY THE SUPERVISOR TO DISPATCH TO EACH TEST.
2272                                    ;//////////////////////////////////////////////////////////////////////////////
2273
2274  002122                                DISPATCH 42
 (4)  002122  000052                                                    .WORD   42
 (3)  002124                                                  L$DISPATCH::
 (6)  002124  021636                                                    .WORD   T1
 (6)  002126  021720                                                    .WORD   T2
 (6)  002130  022004                                                    .WORD   T3
 (6)  002132  022130                                                    .WORD   T4
 (6)  002134  022232                                                    .WORD   T5
 (6)  002136  022360                                                    .WORD   T6
 (6)  002140  022500                                                    .WORD   T7
 (6)  002142  022654                                                    .WORD   T8
 (6)  002144  023110                                                    .WORD   T9
 (6)  002146  023226                                                    .WORD   T10
 (6)  002150  023344                                                    .WORD   T11
 (6)  002152  023462                                                    .WORD   T12
 (6)  002154  023600                                                    .WORD   T13
 (6)  002156  024230                                                    .WORD   T14
 (6)  002160  024562                                                    .WORD   T15
 (6)  002162  025052                                                    .WORD   T16
 (6)  002164  025262                                                    .WORD   T17
 (6)  002166  025466                                                    .WORD   T18
 (6)  002170  025672                                                    .WORD   T19
 (6)  002172  026130                                                    .WORD   T20
 (6)  002174  026362                                                    .WORD   T21
 (6)  002176  026634                                                    .WORD   T22
 (6)  002200  027312                                                    .WORD   T23
 (6)  002202  027432                                                    .WORD   T24
 (6)  002204  027542                                                    .WORD   T25
 (6)  002206  027736                                                    .WORD   T26
 (6)  002210  030302                                                    .WORD   T27
 (6)  002212  030512                                                    .WORD   T28
 (6)  002214  031042                                                    .WORD   T29
 (6)  002216  031142                                                    .WORD   T30
 (6)  002220  031512                                                    .WORD   T31
 (6)  002222  032054                                                    .WORD   T32
 (6)  002224  032324                                                    .WORD   T33
 (6)  002226  032666                                                    .WORD   T34
 (6)  002230  033016                                                    .WORD   T35
 (6)  002232  033730                                                    .WORD   T36
 (6)  002234  034212                                                    .WORD   T37
 (6)  002236  034412                                                    .WORD   T38
 (6)  002240  034712                                                    .WORD   T39
 (6)  002242  035002                                                    .WORD   T40
 (6)  002244  035144                                                    .WORD   T41
 (6)  002246  035312                                                    .WORD   T42
2275
2277                                    ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
2278                                    ;       CHANGE THE ARGUMENT OF 'DISPATCH' TO BE THE
2279                                    ;       NUMBER OF HARDWARE TESTS IN YOUR PROGRAM.
```

```
;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

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

```
(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
2355
2356
2357
2358
2359                              ;;*****************************************************************************
2360                              ;* PROGRAM EVENT FLAG DEFINITIONS
2361                              ;;*****************************************************************************
2362
2363
2364
2365
2366
2367                              ;;*************************************************************************************
2368                              ;* MAINTENANCE REGISTER - BSEL1
2369                              ;;*************************************************************************************
2370  000200                      RUN     = BIT7
2371  000100                      MCLR    = BIT6
2372  000020                      STEPLU  = BIT4
2373  000010                      LULOOP  = BIT3
2374  000004                      ROMO    = BIT2
2375  000002                      ROMI    = BIT1
2376  000001                      STEPMP  = BIT0
2377
2378                              ;;*************************************************************************************
```

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

```
                        K 4
2491    000200          READY   = BIT7
2492    000100          TXEN    = BIT6
2493    000040          DISSI   = BIT5
2494    000020          RDAX    = BIT4
2495    000010          WAX     = BIT3
2496    000004          ENAX    = BIT2
2497    000002          AX2     = BIT1
2498    000001          AX1     = BIT0
2499
2500                    ;;*************************************************************************************
2501                    ;* IBUS REG 17
2502                    ;;*************************************************************************************
2503    000200          SIGR    = BIT7
2504    000100          SIGQ    = BIT6
2505    000040          TXDATA  = BIT5
2506    000020          OCOR    = BIT4
2507    000010          ICIR    = BIT3
2508    000004          TESTMD  = BIT2
2509    000002          MCLK    = BIT1
2510    000001          DDCMP   = BIT0
2511
2512                    ;;*************************************************************************************
2513                    ;* AX0-15 - USYRT REG 0 (READ ONLY)
2514                    ;;*************************************************************************************
2515    000200          RX7     = BIT7
2516    000100          RX6     = BIT6
2517    000040          RX5     = BIT5
2518    000020          RX4     = BIT4
2519    000010          RX3     = BIT3
2520    000004          RX2     = BIT2
2521    000002          RX1     = BIT1
2522    000001          RX0     = BIT0
2523
2524                    ;;*************************************************************************************
2525                    ;* AX0-16 - USYRT REG 1 (READ ONLY)
2526                    ;;*************************************************************************************
2527    000200          RERR    = BIT7
2528    000100          ASBC2   = BIT6
2529    000040          ASBC1   = BIT5
2530    000020          ASBC0   = BIT4
2531    000010          ROR     = BIT3
2532    000004          RABT    = BIT2
2533    000002          REOM    = BIT1
2534    000001          RSOM    = BIT0
2535
2536                    ;;*************************************************************************************
2537                    ;* AX1-15 - USYRT REG 2
2538                    ;;*************************************************************************************
2539    000200          TX7     = BIT7
2540    000100          TX6     = BIT6
2541    000040          TX5     = BIT5
2542    000020          TX4     = BIT4
2543    000010          TX3     = BIT3
2544    000004          TX2     = BIT2
2545    000002          TX1     = BIT1
2546    000001          TX0     = BIT0
```

```
                        ;;*****************************************************************************************
                        ;* AX1-16 - USYRT REG 3
                        ;;*****************************************************************************************
000200                  TERR    = BIT7
000010                  TXGA    = BIT3
000004                  TXAB    = BIT2
000002                  TEOM    = BIT1
000001                  TSOM    = BIT0

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

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

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

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

```
2603            000001          RXLEN0  = BIT0
2604
2605
2606
2607
2608
2609                            ;*****************************************************************************************
2610                            ;* TX CONTROL BITS DEFINED ON WORD BASIS
2611                            ;*****************************************************************************************
2612            004000          TXGOA   = BIT11
2613            002000          TXABT   = BIT10
2614            001000          TXEOM   = BIT9
2615            000400          TXSOM   = BIT8
2616
2617
2618
2619
2620
2621                            ;*************************************************************************
2622                            ;* RCV CONTROL BITS DEFINED ON WORD BASIS
2623                            ;*************************************************************************
2624            004000          RXOVR   = BIT11
2625            002000          RXABT   = BIT10
2626            001000          RXEBL   = BIT9
2627            000400          RXBCC   = BIT8
2628
2629
2630
2631
2632                            ;*****************************************************************************************
2633                            ;* ADDRESS EQUATES FOR REGISTER STORAGE TABLE (LUREG:)
2634                            ;*****************************************************************************************
2635            002302          LUR10   = LUREG+0       ;LINE UNIT IBUS REG 10
2636            002304          LUR11   = LUREG+2       ;LINE UNIT IBUS REG 11
2637            002306          LUR12   = LUREG+4       ;LINE UNIT IBUS REG 12
2638            002310          LUR13   = LUREG+6       ;LINE UNIT IBUS REG 13
2639            002312          LUR14   = LUREG+10      ;LINE UNIT IBUS REG 14
2640            002314          LUR15   = LUREG+12      ;LINE UNIT IBUS REG 15
2641            002316          LUR16   = LUREG+14      ;LINE UNIT IBUS REG 16
2642            002320          LUR17   = LUREG+16      ;LINE UNIT IBUS REG 17
2643            002322          AX0.15  = LUREG+20      ;USYRT REG 0
2644            002324          AX0.16  = LUREG+22      ;USYRT REG 1
2645            002326          AX1.15  = LUREG+24      ;USYRT REG 2
2646            002330          AX1.16  = LUREG+26      ;USYRT REG 3
2647            002332          AX2.15  = LUREG+30      ;USYRT REG 4
2648            002334          AX2.16  = LUREG+32      ;USYRT REG 5
2649            002336          AX3.15  = LUREG+34      ;USYRT REG 6
2650            002340          AX3.16  = LUREG+36      ;USYRT REG 7
2651
2652
2653
2654
2655
2656            100000          CHPCHK  = BIT15
2657
2658            100000          BCCCHK  = BIT15
```

```
                100000          CRCCHK  = BIT15
                
                
                
                
                
                
                                ;*****************************************************************************
                                ;* MICROINSTRUCTION DEFINITIONS
                                ;*****************************************************************************
                021000          MVIOX   = 021000                ;MOVE IBUS TO OBUS*
                122000          MVIXO   = 122000                ;MOVE IBUS* TO OBUS
                121000          MVIXOX  = 121000                ;MOVE IBUS* TO OBUS*
                
                
                
                                ;***** ERROR1 BIT FLAG DEFINITIONS *****
                000001          RRDYTO  = BIT0
                000002          WRDYTO  = BIT1
                
                
                
                
```

```
                        .SBTTL  GLOBAL DATA SECTION

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

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

```
2739  002454  160174          SEL4:   .WORD   160174          ;POINTER TO SEL4
2740  002456  160176          SEL6:   .WORD   160176          ;POINTER TO SEL6
2741  002460  000300          MPIVEC: .WORD      300          ;MICROPROCESSOR INPUT INTERRUPT VECTOR
2742  002462  000304          MPOVEC: .WORD      304          ;MICROPROCESSOR OUTPUT INTERRUPT VECTOR
2743  002464  000240          MPRIOR: .WORD      240          ;MICROPROCESSOR DEVICE PRIORITY
2744  002466  000000          LUSWI1: .WORD        0          ;LINE UNIT SWITCH PACK #1
2745  002470  000000          LUSWI2: .WORD        0          ;LINE UNIT SWITCH PACK #2
2746  002472  000000          LUSWI3: .WORD        0          ;LINE UNIT SWITCH PACK #3
2747  002474  000000          TSTCON: .WORD        0          ;TEST CONNECTOR INDICATOR
2748  002476  000000          RUNINH: .WORD        0          ;RUN SWITCH INDICATOR
2749
2750                          ;***** STORAGE FOR DATA READ IN ADDRESS TESTS *****
2751  002500      000         REDDAT: .BYTE   0
2752  002501      000                 .BYTE   0
2753  002502      000                 .BYTE   0
2754  002503      000                 .BYTE   0
2755  002504      000                 .BYTE   0
2756  002505      000                 .BYTE   0
2757  002506      000                 .BYTE   0
2758  002507      000                 .BYTE   0
2759
2760                          ;;****  GEN'L PURPOSE SCRATCH STORAGE  *****
2761  002510  000000          REG0:   .WORD   0
2762  002512  000000          REG1:   .WORD   0
2763  002514  000000          REG2:   .WORD   0
2764  002516  000000          REG3:   .WORD   0
2765  002520  000000          REG4:   .WORD   0
2766  002522  000000          REG5:   .WORD   0
2767  002524  000000          REG6:   .WORD   0
2768  002526  000000          REG7:   .WORD   0
2769
2770                          ;;****  SCRATCH STORAGE FOR MESSAGE REPORTING   *****
2771  002530  000000          TMP0:   .WORD   0
2772  002532  000000          TMP1:   .WORD   0
2773  002534  000000          TMP2:   .WORD   0
2774  002536  000000          TMP3:   .WORD   0
2775  002540  000000          TMP4:   .WORD   0
2776  002542  000000          TMP5:   .WORD   0
2777  002544  000000          TMP6:   .WORD   0
2778  002546  000000          TMP7:   .WORD   0
2779
2780                          ;***** INBUS LU REG BIT MASKS FOR UNPREDICTABLE BITS *****
2781  002550                  UPBITS:
2782  002550      000                 .BYTE   000             ;MASK FOR REG 10
2783  002551      056                 .BYTE   056             ;MASK FOR REG 11
2784  002552      000                 .BYTE   000             ;MASK FOR REG 12
2785  002553      257                 .BYTE   257             ;MASK FOR REG 13
2786  002554      100                 .BYTE   100             ;MASK FOR REG 14
2787  002555      377                 .BYTE   377             ;MASK FOR REG 15
2788  002556      377                 .BYTE   377             ;MASK FOR REG 16
2789  002557      306                 .BYTE   306             ;MASK FOR REG 17
2790
2791  002560      200         R14NRW: .BYTE   200             ;REG 14 NON-R/W BITS
2792
2793                          ;***** MASKS FOR EXTENDED REGISTER NON-READ/WRITE BITS *****
2794  002561                  ANBITS:
```

```
2795  002561  377                .BYTE   377             ;MASK FOR AX0-15
2796  002562  377                .BYTE   377             ;MASK FOR AX0-16
2797  002563  000                .BYTE   000             ;MASK FOR AX1-15
2798  002564  360                .BYTE   360             ;MASK FOR AX1-16
2799  002565  000                .BYTE   000             ;MASK FOR AX2-15
2800  002566  000                .BYTE   000             ;MASK FOR AX2-16
2801  002567  004                .BYTE   004             ;MASK FOR AX3-15
2802  002570  030                .BYTE   030             ;MASK FOR AX3-16
2803
2804                          ;***** DATA PATTERN A *****
2805  002571                  PATA:
2806  002571  125                .BYTE   125
2807  002572  252                .BYTE   252
2808  002573  000                .BYTE   000
2809  002574  377                .BYTE   377
2810  002575  001                .BYTE   001
2811  002576  002                .BYTE   002
2812  002577  004                .BYTE   004
2813  002600  010                .BYTE   010
2814  002601  020                .BYTE   020
2815  002602  040                .BYTE   040
2816  002603  100                .BYTE   100
2817  002604  200                .BYTE   200
2818  002605  376                .BYTE   376
2819  002606  375                .BYTE   375
2820  002607  373                .BYTE   373
2821  002610  367                .BYTE   367
2822  002611  357                .BYTE   357
2823  002612  337                .BYTE   337
2824  002613  277                .BYTE   277
2825  002614  177                .BYTE   177
2826
2827                          ;***** DATA PATTERN B *****
2828  002615                  PATB:
2829  002615  000                .BYTE   000
2830  002616  000                .BYTE   000
2831  002617  040                .BYTE   040
2832  002620  100                .BYTE   100
2833  002621  220                .BYTE   220
2834  002622  000                .BYTE   000
2835  002623  000                .BYTE   000
2836  002624  051                .BYTE   051
2837
2838                          ;***** DATA PATTERN C *****
2839  002625                  PATC:
2840  002625  020                .BYTE   020
2841  002626  020                .BYTE   020
2842  002627  020                .BYTE   020
2843
2844                          ;***** DATA PATTERN D *****
2845  002630                  PATD:
2846  002630  000                .BYTE   000
2847  002631  040                .BYTE   040
2848  002632  000                .BYTE   000
2849
2850                          ;***** DATA PATTERN E *****
```

```
2851  002633                          PATE:
2852  002633  000                             .BYTE   000
2853  002634  120                             .BYTE   120
2854  002635  020                             .BYTE   020
2855  002636  100                             .BYTE   100
2856  002637  120                             .BYTE   120
2857  002640  000                             .BYTE   000
2858
2859                                  ;***** DATA PATTERN F *****
2860  002641                          PATF:
2861  002641  050                             .BYTE   050
2862  002642  051                             .BYTE   051
2863  002643  050                             .BYTE   050
2864
2865                                  ;***** DATA PATTERN G *****
2866  002644                          PATG:
2867  002644  000                             .BYTE   000
2868  002645  000                             .BYTE   000
2869  002646  240                             .BYTE   240
2870  002647  120                             .BYTE   120
2871  002650  177                             .BYTE   177
2872  002651  000                             .BYTE   000
2873  002652  000                             .BYTE   000
2874  002653  001                             .BYTE   001
2875
2876                                  ;***** DATA PATTERN H *****
2877  002654                          PATH:
2878  002654  000                             .BYTE   000
2879  002655  000                             .BYTE   000
2880  002656  377                             .BYTE   377
2881  002657  017                             .BYTE   017
2882  002660  377                             .BYTE   377
2883  002661  377                             .BYTE   377
2884  002662  375                             .BYTE   375
2885  002663  377                             .BYTE   377
2886
2887                                  ;***** DATA PATTERN I *****
2888  002664                          PATI:
2889  002664  000                             .BYTE   000
2890  002665  000                             .BYTE   000
2891  002666  000                             .BYTE   000
2892  002667  000                             .BYTE   000
2893  002670  000                             .BYTE   000
2894  002671  103                             .BYTE   103
2895  002672  000                             .BYTE   000
2896  002673  000                             .BYTE   000
2897
2898                                  ;***** DATA PATTERN J *****
2899  002674                          PATJ:
2900  002674  000                             .BYTE   000
2901  002675  000                             .BYTE   000
2902  002676  010                             .BYTE   010
2903  002677  002                             .BYTE   002
2904  002700  004                             .BYTE   004
2905  002701  103                             .BYTE   103
2906  002702  001                             .BYTE   001
```

```
2907  002703  100                     .BYTE   100
2908
2909                                  ;***** DATA PATTERN K *****
2910  002704  000                     PATK:   .BYTE   000
2911  002705  000                             .BYTE   000
2912  002706  377                             .BYTE   377
2913  002707  377                             .BYTE   377
2914  002710  125                             .BYTE   125
2915  002711  125                             .BYTE   125
2916  002712  252                             .BYTE   252
2917  002713  252                             .BYTE   252
2918  002714  001                             .BYTE   001
2919  002715  000                             .BYTE   000
2920  002716  002                             .BYTE   002
2921  002717  000                             .BYTE   000
2922  002720  004                             .BYTE   004
2923  002721  000                             .BYTE   000
2924  002722  010                             .BYTE   010
2925  002723  000                             .BYTE   000
2926  002724  020                             .BYTE   020
2927  002725  000                             .BYTE   000
2928  002726  040                             .BYTE   040
2929  002727  000                             .BYTE   000
2930  002730  100                             .BYTE   100
2931  002731  000                             .BYTE   000
2932  002732  200                             .BYTE   200
2933  002733  000                             .BYTE   000
2934  002734  000                             .BYTE   000
2935  002735  001                             .BYTE   001
2936  002736  000                             .BYTE   000
2937  002737  002                             .BYTE   002
2938  002740  000                             .BYTE   000
2939  002741  004                             .BYTE   004
2940  002742  000                             .BYTE   000
2941  002743  010                             .BYTE   010
2942  002744  000                             .BYTE   000
2943  002745  020                             .BYTE   020
2944  002746  000                             .BYTE   000
2945  002747  040                             .BYTE   040
2946  002750  000                             .BYTE   000
2947  002751  100                             .BYTE   100
2948  002752  000                             .BYTE   000
2949  002753  200                             .BYTE   200
2950  002754  376                             .BYTE   376
2951  002755  377                             .BYTE   377
2952  002756  375                             .BYTE   375
2953  002757  377                             .BYTE   377
2954  002760  373                             .BYTE   373
2955  002761  377                             .BYTE   377
2956  002762  367                             .BYTE   367
2957  002763  377                             .BYTE   377
2958  002764  357                             .BYTE   357
2959  002765  377                             .BYTE   377
2960  002766  337                             .BYTE   337
2961  002767  377                             .BYTE   377
2962  002770  277                             .BYTE   277
```

```
2963   002771   377                    .BYTE   377
2964   002772   177                    .BYTE   177
2965   002773   377                    .BYTE   377
2966   002774   377                    .BYTE   377
2967   002775   376                    .BYTE   376
2968   002776   377                    .BYTE   377
2969   002777   375                    .BYTE   375
2970   003000   377                    .BYTE   377
2971   003001   373                    .BYTE   373
2972   003002   377                    .BYTE   377
2973   003003   367                    .BYTE   367
2974   003004   377                    .BYTE   377
2975   003005   357                    .BYTE   357
2976   003006   377                    .BYTE   377
2977   003007   337                    .BYTE   337
2978   003010   377                    .BYTE   377
2979   003011   277                    .BYTE   277
2980   003012   377                    .BYTE   377
2981   003013   177                    .BYTE   177
2982
2983                                ;***** DATA PATTERN L *****
2984   003014                       PATL:
2985   003014   000                    .BYTE   000
2986   003015   000                    .BYTE   000
2987   003016   377                    .BYTE   377
2988   003017   377                    .BYTE   377
2989   003020   000                    .BYTE   000
2990   003021   000                    .BYTE   000
2991
2992                                ;***** DATA PATTERN M *****
2993   003022                       PATM:
2994   003022   000                    .BYTE   000
2995   003023   020                    .BYTE   020
2996   003024   000                    .BYTE   000
2997   003025   000                    .BYTE   000
2998   003026   200                    .BYTE   200
2999   003027   000                    .BYTE   000
3000   003030   000                    .BYTE   000
3001   003031   051                    .BYTE   051
3002
3003                                ;***** DATA PATTERN N *****
3004   003032                       PATN:
3005   003032   000                    .BYTE   000
3006   003033   000                    .BYTE   000
3007   003034   000                    .BYTE   000
3008   003035   125                    .BYTE   125
3009   003036   000                    .BYTE   000
3010   003037   252                    .BYTE   252
3011   003040   000                    .BYTE   000
3012   003041   377                    .BYTE   377
3013   003042   005                    .BYTE   005
3014   003043   000                    .BYTE   000
3015   003044   012                    .BYTE   012
3016   003045   000                    .BYTE   000
3017   003046   017                    .BYTE   017
3018   003047   000                    .BYTE   000
```

```
3019
3020                                    ;***** DATA PATTERN 0 *****
3021  003050                            PAT0:
3022  003050  000                               .BYTE   000
3023  003051  041                               .BYTE   041
3024  003052  004                               .BYTE   004
3025  003053  010                               .BYTE   010
3026  003054  020                               .BYTE   020
3027  003055  040                               .BYTE   040
3028  003056  100                               .BYTE   100
3029  003057  101                               .BYTE   101
3030  003060  200                               .BYTE   200
3031  003061  201                               .BYTE   201
3032  003062  300                               .BYTE   300
3033  003063  111                               .BYTE   111
3034  003064  301                               .BYTE   301
3035  003065  375                               .BYTE   375
3036
3037                                    ;***** DATA PATTERN P *****
3038  003066                            PATP:
3039  003066  000                               .BYTE   000
3040  003067  113                               .BYTE   113
3041  003070  200                               .BYTE   200
3042  003071  040                               .BYTE   040
3043  003072  020                               .BYTE   020
3044  003073  010                               .BYTE   010
3045  003074  001                               .BYTE   001
3046  003075  104                               .BYTE   104
3047  003076  007                               .BYTE   007
3048  003077  105                               .BYTE   105
3049  003100  007                               .BYTE   007
3050  003101  144                               .BYTE   144
3051  003102  107                               .BYTE   107
3052  003103  157                               .BYTE   157
3053
3054                                    ;***** DATA PATTERN U *****
3055  003104  000                       PATU:   .BYTE   000
3056  003105  000                               .BYTE   000
3057  003106  001                               .BYTE   001
3058  003107  000                               .BYTE   000
3059  003110  013                               .BYTE   013
3060  003111  000                               .BYTE   000
3061  003112  011                               .BYTE   011
3062  003113  000                               .BYTE   000
3063  003114  021                               .BYTE   021
3064  003115  000                               .BYTE   000
3065  003116  101                               .BYTE   101
3066  003117  000                               .BYTE   000
3067  003120  301                               .BYTE   301
3068  003121  000                               .BYTE   000
3069  003122  000                               .BYTE   000
3070  003123  001                               .BYTE   001
3071  003124  000                               .BYTE   000
3072  003125  002                               .BYTE   002
3073  003126  000                               .BYTE   000
3074  003127  004                               .BYTE   004
```

```
3075  003130  000                    .BYTE   000
3076  003131  040                    .BYTE   040
3077  003132  000                    .BYTE   000
3078  003133  100                    .BYTE   100
3079  003134  000                    .BYTE   000
3080  003135  200                    .BYTE   200
3081  003136  000                    .BYTE   000
3082  003137  346                    .BYTE   346
3083  003140  000                    .BYTE   000
3084  003141  345                    .BYTE   345
3085  003142  000                    .BYTE   000
3086  003143  343                    .BYTE   343
3087  003144  000                    .BYTE   000
3088  003145  307                    .BYTE   307
3089  003146  000                    .BYTE   000
3090  003147  247                    .BYTE   247
3091  003150  000                    .BYTE   000
3092  003151  147                    .BYTE   147
3093
3094                                 ;***** PATTERN V *****
3095  003152  000                    PATV:   .BYTE   000
3096  003153  000                            .BYTE   000
3097  003154  333                            .BYTE   333
3098  003155  000                            .BYTE   000
3099  003156  331                            .BYTE   331
3100  003157  000                            .BYTE   000
3101  003160  323                            .BYTE   323
3102  003161  000                            .BYTE   000
3103  003162  313                            .BYTE   313
3104  003163  000                            .BYTE   000
3105  003164  233                            .BYTE   233
3106  003165  000                            .BYTE   000
3107  003166  133                            .BYTE   133
3108  003167  000                            .BYTE   000
3109  003170  000                            .BYTE   000
3110  003171  001                            .BYTE   001
3111  003172  000                            .BYTE   000
3112  003173  002                            .BYTE   002
3113  003174  000                            .BYTE   000
3114  003175  004                            .BYTE   004
3115  003176  000                            .BYTE   000
3116  003177  040                            .BYTE   040
3117  003200  000                            .BYTE   000
3118  003201  100                            .BYTE   100
3119  003202  000                            .BYTE   000
3120  003203  200                            .BYTE   200
3121  003204  000                            .BYTE   000
3122  003205  346                            .BYTE   346
3123  003206  000                            .BYTE   000
3124  003207  345                            .BYTE   345
3125  003210  000                            .BYTE   000
3126  003211  343                            .BYTE   343
3127
3128  003212  000                    .BYTE   000
3129  003213  307                    .BYTE   307
3130  003214  000                    .BYTE   000
```

```
                                                J 5
3131  003215  247                       .BYTE   247
3132  003216  000                       .BYTE   000
3133  003217  147                       .BYTE   147
3134
3135  003220                    ENDPAT:
3136                            .EVEN
3137
3138
3139
3140
3141
3142                            ;***  TEST MESSAGES TO BE TRANSMITTED  ***
3143
3144  003220  000400            MSG1:   TXSOM
3145  003222  000400                    TXSOM
3146  003224  000000                    000
3147  003226  000125                    125
3148  003230  000252                    252
3149  003232  000377                    377
3150  003234  000000                    000
3151  003236  001000                    TXEOM
3152  003240  001000                    TXEOM
3153  003242  001000                    TXEOM
3154  003244  001000                    TXEOM
3155
3156  003246  000377            MSG4:   377
3157  003250  000000                    000
3158  003252  000125                    125
3159  003254  000252                    252
3160  003256  001000                    TXEOM
3161  003260  001000                    TXEOM
3162
3163
3164
3165
3166
3167                            ;*** RECEIVED DATA BUFFER (64. WORDS) ***
3168  003262  000100            RCVBUF: .BLKW   64.
3169
3170
3171
3172
3173
3174
3175
3176
3177
3178
```

```
                                        .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
```

```
3193
3194                                    ;;*****************************************************************************
3195                                    ;* TITLE OF PROGRAM
3196                                    ;;*****************************************************************************
3197  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
3198
3199
3200                                    ;
3201                                    ; FORMAT STATEMENTS USED IN PRINT CALLS
3202                                    ;
3203
3205                                    ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
3206                                    ;     INSERT THE FORMAT STATEMENTS USED IN THE VARIOUS PRINT CALLS.
3207                                    ;     USE THE .ASCIZ STATEMENT.
3208                                    ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
3210
3211
3212
3213
3214
```

```
                                .SBTTL  GLOBAL SUBROUTINES

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



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



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



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

```
3272  003672                          READLU:
3273  003672  010146                          MOV     R1,-(SP)        ;SAVE R1
3274  003674  013701  002400                  MOV     REGNUM,R1       ;GET LINE UNIT REG NUMBER
3275  003700  006301                          ASL     R1              ;SHIFT INTO SOURCE BITS 4-7
3276  003702  006301                          ASL     R1
3277  003704  006301                          ASL     R1
3278  003706  006301                          ASL     R1
3279  003710  052701  000004                  BIS     #4,R1           ;SET DESTINATION = BSEL4
3280  003714  052701  021000                  BIS     #MVIOX,R1       ;SET REST OF MOVE INSTRUCTION
3281  003720  010137  003730                  MOV     R1,2$           ;SET INSTRUCTION AS SUBROUTINE ARGUMENT
3282  003724  004737  003540                  JSR     PC,STPCLK       ;EXECUTE MOVE INSTRUCTION
3283  003730  000000                  2$:     .WORD   0               ;INSTRUCTION GOES HERE
3284  003732  117737  176516  002364          MOVB    @BSEL4,REDBYT   ;GET LU REG CONTENTS INTO REDBYT
3285  003740  105037  002365                  CLRB    REDBYT+1        ;CLR HI BYTE OF STORAGE
3286  003744  012601                          MOV     (SP)+,R1        ;RESTORE R1
3287  003746  000207                          RTS     PC              ;RETURN
3288
3289
3290
3291
3292
3293                                  ;*********************************************************************************
3294                                  ;* WRITLU - THIS SUBROUTINE FORCES THE DMC11 OR KMC11 MICROPROCESSOR TO
3295                                  ;*       EXECUTE AN INSTRUCTION WHICH LOADS THE BYTE CONTAINED IN WRIBYT
3296                                  ;*       INTO THE LU REG WHOSE NUMBER IS PASSED IN REGNUM.
3297                                  ;*********************************************************************************
3298  003750                          WRITLU:
3299  003750  010146                          MOV     R1,-(SP)        ;SAVE R1
3300  003752  013701  002400                  MOV     REGNUM,R1       ;GET LINE UNIT REG NUMBER
3301  003756  052701  000100                  BIS     #100,R1         ;SET SOURCE = BSEL4
3302  003762  052701  122000                  BIS     #MVIXO,R1       ;SET REST OF MOVE INSTRUCTION
3303  003766  010137  004010                  MOV     R1,2$           ;SET INSTRUCTION AS SUBROUTINE ARGUMENT
3304  003772  105037  002367                  CLRB    WRIBYT+1        ;CLR HI BYTE OF STORAGE
3305  003776  113777  002366  176450          MOVB    WRIBYT,@BSEL4   ;LOAD BYTE INTO BSEL4
3306  004004  004737  003540                  JSR     PC,STPCLK       ;EXECUTE MOVE INSTRUCTION
3307  004010  000000                  2$:     .WORD   0
3308  004012  012601                          MOV     (SP)+,R1        ;RESTORE R1
3309  004014  000207                          RTS     PC              ;RETURN
3310
3311
3312
3313
3314
3315                                  ;*********************************************************************************
3316                                  ;* GETREG - THIS SUBROUTINE READS THE LINE UNIT REGISTERS 10-17 INTO THE
3317                                  ;*       REGISTER STORAGE TABLE (LUREG:).
3318                                  ;*********************************************************************************
3319  004016  010146                  GETREG: MOV     R1,-(SP)        ;SAVE R1
3320  004020  013746  002400                  MOV     REGNUM,-(SP)    ;SAVE CURRENT REG NO.
3321  004024  012701  002302                  MOV     #LUR10,R1       ;INIT POINTER TO REG STORAGE TABLE
3322  004030  012737  000010  002400          MOV     #10,REGNUM      ;INIT LU REG NO. TO 10
3323  004036  004737  003672          3$:     JSR     PC,READLU       ;READ A LINE UNIT REG
3324  004042  113721  002364                  MOVB    REDBYT,(R1)+    ;PUT BYTE READ INTO TABLE
3325  004046  105021                          CLRB    (R1)+           ;CLEAR UPPER BYTE OF TABLE ENTRY
3326  004050  005237  002400                  INC     REGNUM          ;INCREMENT REG NO.
3327  004054  023727  002400  000020          CMP     REGNUM,#20      ;SEE IF ALL REGS READ YET
```

```
3328  004062  002765                      BLT     3$                  ;BR IF NOT
3329  004064  012637  002400              MOV     (SP)+,REGNUM        ;RESTORE CURRENT REG NO.
3330  004070  012601                      MOV     (SP)+,R1            ;RESTORE R1
3331  004072  000207                      RTS     PC                  ;RETURN
3332
3333
3334
3335
3336
3337                          ;*************************************************************************************
3338                          ;* LOOPIN - THIS SUBROUTINE PLACES THE MICROPROCESSOR IN A LOOP ON AN
3339                          ;*      INSTRUCTION, BY MOVING THE INSTRUCTION FROM THE WORD FOLLOWING THE CALL
3340                          ;*      INTO SEL6, AND SETTING RUN AND ROMI IN BSEL1. THE SUBROUTINE RETURNS
3341                          ;*      WITH THE MICROPROCESSOR STUCK IN THE LOOP, AND IF IT IS DESIRED TO
3342                          ;*      TERMINATE THE LOOP, THE PDP-11 PROGRAM MUST CLEAR THE RUN BIT IN
3343                          ;*      BSEL1, OR CALL SUBROUTINE MSTCLR TO DO THIS.
3344                          ;*************************************************************************************
3345  004074                  LOOPIN:
3346  004074  152777  000006  176346      BISB    #ROMO!ROMI,@BSEL1       ;SET ROMO, ROMI BITS IN BSEL1
3347  004102  017677  000000  176346      MOV     @(SP),@SEL6     ;PUT MICROINSTRUCTION INTO SEL6
3348  004110  152777  000206  176332      BISB    #RUN!ROMO!ROMI,@BSEL1 ;SET RUN, ROMO, ROMI IN BSEL1
3349  004116  062716  000002              ADD     #2,(SP)         ;FIX UP RETURN PC
3350  004122  000207                      RTS     PC              ;RETURN WITH MICROPROCESSOR STUCK IN SINGLE
3351                                                              ;    INSTRUCTION LOOP
3352
3353
3354
3355
3356
3357                          ;*************************************************************************************
3358                          ;* READAX - THIS SUBROUTINE READS THE USYRT REG PAIR WHOSE NUMBER (0-3)
3359                          ;*      IS PASSED IN BITS 1,2 OF AXNUM ON ENTRY, AND RETURNS THE BYTES READ IN
3360                          ;*      RAX15 AND RAX16. IF THE LINE UNIT DOES NOT RESPOND WITH READY IN REG 14,
3361                          ;*      RRDYTO BIT IS SET IN ERROR1 ON RETURN.
3362                          ;*************************************************************************************
3363  004124  010146          READAX: MOV     R1,-(SP)            ;SAVE R1
3364  004126  013746  002400          MOV     REGNUM,-(SP)        ;STORE CURRENT REG NO.
3365  004132  042737  000001  002420      BIC     #RRDYTO,ERROR1  ;CLEAR ERROR BIT
3366  004140  012737  000014  002400      MOV     #14,REGNUM      ;SET LU REG NO. = 14
3367  004146  113737  002402  002366      MOVB    AXNUM,WRIBYT    ;SET UP AX REG NO. BITS
3368  004154  006237  002366              ASR     WRIBYT
3369  004160  152737  000024  002366      BISB    #RDAX!ENAX,WRIBYT ;SET UP BITS TO LOAD INTO REG 14
3370  004166  053737  002426  002366      BIS     DISILO,WRIBYT   ;SET PROPER STATE OF DISSI BIT
3371  004174  004737  003750              JSR     PC,WRITLU       ;SET RDAX AND ENAX IN REG 14
3372  004200  005001                      CLR     R1              ;INIT TIMER
3373  004202  004737  003672      6$:     JSR     PC,READLU       ;READ REG 14
3374  004206  132737  000200  002364      BITB    #READY,REDBYT   ;SEE IF READY BIT SET IN REG 14 YET
3375  004214  001006                      BNE     9$              ;BR IF READY SET
3376  004216  005201                      INC     R1              ;INCR TIMER
3377  004220  001370                      BNE     6$              ;BR IF TIMER DIDN'T TIME OUT YET
3378  004222  052737  000001  002420      BIS     #RRDYTO,ERROR1  ;SET ERROR FLAG FOR TIME OUT ON READ RDY
3379  004230  000424                      BR      12$             ;BR TO RETURN
3380  004232  012737  000015  002400  9$: MOV     #15,REGNUM      ;SET REG NO. = 15
3381  004240  004737  003672              JSR     PC,READLU       ;READ REG 15
3382  004244  113737  002364  002370      MOVB    REDBYT,RAX15    ;STORE REG AX-15
3383  004252  105037  002371              CLRB    RAX15+1         ;CLR HI BYTE OF STORAGE
```

```
3384  004256  012737  000016  002400          MOV     #16,REGNUM      ;SET REG NO. = 16
3385  004264  004737  003672                  JSR     PC,READLU       ;READ REG 16
3386  004270  113737  002364  002372          MOVB    REDBYT,RAX16    ;STORE REG AX-16
3387  004276  105037  002373                  CLRB    RAX16+1         ;CLR HI BYTE OF STORAGE
3388  004302  012637  002400          12$:    MOV     (SP)+,REGNUM    ;RESTORE CURRENT REG NO.
3389  004306  012601                          MOV     (SP)+,R1        ;RESTORE R1
3390  004310  000207                          RTS     PC              ;RETURN
3391
3392
3393
3394
3395                                  ;*****************************************************************************
3396                                  ;* WRITAX - THIS SUBROUTINE WRITES THE USYRT REG PAIR WHOSE NUMBER (0-3) IS
3397                                  ;*       PASSED IN BITS 1,2 OF AXNUM ON ENTRY, WITH THE DATA FROM WAX15 AND
3398                                  ;*       WAX16. IF LINE UNIT DOES NOT RESPOND WITH READY IN REG 14, WRDYTO BIT
3399                                  ;*       IS SET IN ERROR1 ON RETURN.
3400                                  ;*****************************************************************************
3401  004312  010146                  WRITAX: MOV     R1,-(SP)        ;SAVE R1
3402  004314  013746  002400                  MOV     REGNUM,-(SP)    ;SAVE CURRENT REG NO.
3403  004320  042737  000002  002420          BIC     #WRDYTO,ERROR1  ;CLEAR ERROR BIT
3404  004326  012737  000014  002400          MOV     #14,REGNUM      ;SET LU REG NO. = 14
3405  004334  113737  002402  002366          MOVB    AXNUM,WRIBYT    ;SET AX REG NO. BITS
3406  004342  006237  002366                  ASR     WRIBYT
3407  004346  053737  002426  002366          BIS     DISILO,WRIBYT   ;SET PROPER STATE OF DISSI BIT
3408  004354  004737  003750                  JSR     PC,WRITLU       ;SET AX NO. BITS IN REG 14
3409  004360  012737  000015  002400          MOV     #15,REGNUM      ;SET REG NO. = 15
3410  004366  105037  002375                  CLRB    WAX15+1         ;CLR HI BYTE OF STORAGE
3411  004372  113737  002374  002366          MOVB    WAX15,WRIBYT    ;SET UP BYTE TO WRITE INTO REG 15
3412  004400  004737  003750                  JSR     PC,WRITLU       ;WRITE BYTE INTO REG 15
3413  004404  005237  002400                  INC     REGNUM          ;SET REG NO. = 16
3414  004410  105037  002377                  CLRB    WAX16+1         ;CLR HI BYTE OF STORAGE
3415  004414  113737  002376  002366          MOVB    WAX16,WRIBYT    ;SET UP BYTE TO WRITE INTO REG 16
3416  004422  004737  003750                  JSR     PC,WRITLU       ;WRITE BYTE INTO REG 16
3417  004426  012737  000014  002400          MOV     #14,REGNUM      ;SET REG NO. = 14
3418  004434  113737  002402  002366          MOVB    AXNUM,WRIBYT    ;SET AX REG NO. BITS
3419  004442  006237  002366                  ASR     WRIBYT
3420  004446  152737  000014  002366          BISB    #ENAX!WAX,WRIBYT ;SET UP BITS TO LOAD INTO REG 14
3421  004454  053737  002426  002366          BIS     DISILO,WRIBYT   ;SET PROPER STATE OF DISSI BIT
3422  004462  004737  003750                  JSR     PC,WRITLU       ;SET ENAX AND WAX IN REG 14
3423  004466  005001                          CLR     R1              ;INIT PROGRAM TIMER
3424  004470  004737  003672          6$:     JSR     PC,READLU       ;READ REG 14
3425  004474  132737  000200  002364          BITB    #READY,REDBYT   ;SEE IF READY BIT SET IN REG 14 YET
3426  004502  001005                          BNE     9$              ;BR IF READY SET
3427  004504  005201                          INC     R1              ;INCR TIMER
3428  004506  001370                          BNE     6$              ;BR IF TIMER DIDN'T TIME OUT YET
3429  004510  052737  000002  002420          BIS     #WRDYTO,ERROR1  ;SET ERROR FLAG BIT FOR TIME OUT ON WRITE RDY
3430  004516  012637  002400          9$:     MOV     (SP)+,REGNUM    ;RESTORE CURRENT REG NO.
3431  004522  012601                          MOV     (SP)+,R1        ;RESTORE R1
3432  004524  000207                          RTS     PC              ;RETURN
3433
3434
3435
3436
3437
3438                                  ;*****************************************************************************
3439                                  ;* GETALL - THIS SUBROUTINE READS THE LINE UNIT REGS 10-17 AND THE EXTENDED
```

```
                                        ;*      REGISTERS AX0-AX3 INTO REGISTER STORAGE TABLE (LUREG:).
                                        ;*************************************************************************************
004526  010146                  GETALL: MOV     R1,-(SP)        ;SAVE R1
004530  013746  002402                  MOV     AXNUM,-(SP)     ;SAVE CURRENT AX REG BYTE NO.
004534  012737  014437  002530          MOV     #DH5,TMP0       ;SET AX LO BYTE NO.
004542  032737  000001  002402          BIT     #BIT0,AXNUM     ;SEE IF LO OR HI BYTE
004550  001403                          BEQ     1$              ;BR IF LO BYTE
004552  012737  014442  002530          MOV     #DH6,TMP0       ;SET AX HI BYTE NO.
004560  004737  004016              1$: JSR     PC,GETREG       ;READ AND STORE REGS 10-17
004564  142777  000010  175656          BICB    #LULOOP,@BSEL1  ;CLEAR LULOOP
004572  012701  002322                  MOV     #AX0.15,R1      ;INIT POINTER TO REG STORAGE TABLE
004576  005037  002402                  CLR     AXNUM           ;INIT AX REG BYTE NO. TO 0
004602  004737  004124              3$: JSR     PC,READAX       ;READ 2 AX REG BYTES
004606  113721  002370                  MOVB    RAX15,(R1)+     ;PUT LO BYTE READ INTO TABLE
004612  105021                          CLRB    (R1)+           ;CLEAR UPPER BYTE OF TABLE ENTRY
004614  113721  002372                  MOVB    RAX16,(R1)+     ;PUT HI BYTE READ INTO TABLE
004620  105021                          CLRB    (R1)+           ;CLEAR UPPER BYTE OF TABLE ENTRY
004622  062737  000002  002402          ADD     #2,AXNUM        ;INCR AX REG BYTE NO.
004630  023727  002402  000010          CMP     AXNUM,#10       ;SEE IF ALL REGS READ YET
004636  002761                          BLT     3$              ;BR IF NOT
004640  012637  002402                  MOV     (SP)+,AXNUM     ;RESTORE CURRENT AX REG BYTE NO.
004644  012601                          MOV     (SP)+,R1        ;RESTORE R1
004646  013737  002402  002532          MOV     AXNUM,TMP1
004654  006237  002532                  ASR     TMP1            ;GET EXTENDED REG NO. FOR PRINTOUT
004660  000207                          RTS     PC              ;RETURN

                                        ;*************************************************************************************
                                        ;* OSIRDY - THIS SUBROUTINE CHECKS FOR THE PROPER STATES OF ORDY (REG 11)
                                        ;*      AND OCOR (REG 17) AND REPORTS AN ERROR IF EITHER IS NOT PROPERLY SET
                                        ;*      AS PASSED IN BIT 0 (ORDY) AND BIT 1 (OCOR) OF THE WORD FOLLOWING THE
                                        ;*      CALL.
                                        ;*      IF AN ERROR OCCURS, A RETURN IS MADE TO THE TEST, AT THE ADDRESS IN
                                        ;*      RETADR.
                                        ;*************************************************************************************
004662  013746  002400          OSIRDY: MOV     REGNUM,-(SP)    ;SAVE LU REG NO.
004666  013746  002352                  MOV     SUBRPC,-(SP)
004672  005737  002352                  TST     SUBRPC          ;SEE IF THIS IS A NESTED CALL
004676  001006                          BNE     1$              ;BR IF YES
004700  016637  000004  002352          MOV     4(SP),SUBRPC
004706  162737  000004  002352          SUB     #4,SUBRPC       ;GET PC OF SUBROUTINE CALL
004714  012737  000011  002400      1$: MOV     #11,REGNUM      ;SET REG NO. TO 11
004722  004737  003672                  JSR     PC,READLU       ;READ REG 11
004726  032776  000001  000004          BIT     #BIT0,@4(SP)    ;GET EXPECTED STATE OF ORDY
004734  001413                          BEQ     3$              ;BR IF EXPECTED ORDY = 0
004736  132737  000020  002364          BITB    #ORDY,REDBYT    ;SEE IF ORDY = 1
004744  001022                          BNE     9$              ;BR IF ORDY = 1
004746  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                                    ;REPORT ORDY NOT SET
004752                                  ERRDF   7,EM7,ERR4
004752  104455                                                          TRAP    C$ERDF
004754  000007                                                          .WORD   7
004756  012376                                                          .WORD   EM7
```

```
                                                                                .WORD   ERR4
3493  004762  000451                    BR      16$             ;TAKE ERROR RETURN
3494  004764  132737  000020  002364  3$:   BITB    #ORDY,REDBYT    ;SEE IF ORDY = 0
3495  004772  001407                    BEQ     9$              ;BR IF ORDY = 0
3496  004774  004737  004526            JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
3497                            ;REPORT ORDY NOT CLEARED
3498  005000                            ERRDF   8,EM8,ERR4
 (4)  005000  104455                                                            TRAP    C$ERDF
 (5)  005002  000010                                                            .WORD   8
 (5)  005004  012413                                                            .WORD   EM8
 (5)  005006  015624                                                            .WORD   ERR4
3499  005010  000436                    BR      16$             ;TAKE ERROR RETURN
3500  005012  012737  000017  002400  9$:   MOV     #17,REGNUM      ;SET REG NO. = 17
3501  005020  004737  003672            JSR     PC,READLU       ;READ LU REG 17
3502  005024  132776  000002  000004    BITB    #BIT1,@4(SP)    ;GET EXPECTED STATE OF OCOR
3503  005032  001413                    BEQ     12$             ;BR IF EXPECTED OCOR = 0
3504  005034  132737  000020  002364    BITB    #OCOR,REDBYT    ;SEE IF OCOR = 1
3505  005042  001031                    BNE     20$             ;BR IF OCOR = 1
3506  005044  004737  004526            JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
3507                            ;REPORT OCOR NOT SET
3508  005050                            ERRDF   9,EM9,ERR4
 (4)  005050  104455                                                            TRAP    C$ERDF
 (5)  005052  000011                                                            .WORD   9
 (5)  005054  012434                                                            .WORD   EM9
 (5)  005056  015624                                                            .WORD   ERR4
3509  005060  000412                    BR      16$             ;TAKE ERROR RETURN
3510  005062  132737  000020  002364  12$:   BITB    #OCOR,REDBYT    ;SEE IF OCOR = 0
3511  005070  001416                    BEQ     20$             ;BR IF OCOR = 0
3512  005072  004737  004526            JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
3513                            ;REPORT OCOR NOT CLEARED
3514  005076                            ERRDF   10,EM10,ERR4
 (4)  005076  104455                                                            TRAP    C$ERDF
 (5)  005100  000012                                                            .WORD   10
 (5)  005102  012451                                                            .WORD   EM10
 (5)  005104  015624                                                            .WORD   ERR4
3515  005106  016637  000002  002400  16$:   MOV     2(SP),REGNUM    ;RESTORE LU REG NO.
3516  005114  013706  002346            MOV     PSTACK,SP       ;RESTORE STACK POINTER TO BASE LEVEL
3517  005120  013746  002362            MOV     RETADR,-(SP)    ;FIX ERROR RETURN PC
3518  005124  000407                    BR      23$
3519  005126  062766  000002  000004  20$:   ADD     #2,4(SP)        ;FIX UP ERROR-FREE RETURN PC
3520  005134  012637  002352            MOV     (SP)+,SUBRPC
3521  005140  012637  002400            MOV     (SP)+,REGNUM    ;RESTORE LU REG NO.
3522  005144  000207                 23$:   RTS     PC              ;RETURN
3523
3524
3525
3526
3527
3528                            ;*******************************************************************************
3529                            ;* WAIT50 - THIS SUBROUTINE STALLS FOR AT LEAST 50 MICRO-SEC, AND THEN RETURNS.
3530                            ;*******************************************************************************
3531  005146  010146            WAIT50: MOV     R1,-(SP)        ;SAVE R1
3532  005150  012701  000310            MOV     #200.,R1        ;INIT COUNTER
3533  005154  005301                 3$:    DEC     R1              ;DECREMENT COUNTER
3534  005156  001376                    BNE     3$              ;BR IF NOT DONE YET
3535  005160  012601                    MOV     (SP)+,R1        ;RESTORE R1
```

```
3536  005162  000207                        RTS     PC              ;RETURN
3537
3538
3539
3540
3541
3542                                  ;*****************************************************************************
3543                                  ;* STALL - THIS SUBROUTINE STALLS FOR ABOUT A MICRO-SEC.
3544                                  ;*****************************************************************************
3545  005164  000240                  STALL:  NOP
3546  005166  000240                          NOP
3547  005170  000240                          NOP
3548  005172  000207                          RTS     PC
3549
3550
3551
3552
3553
3554                                  ;*****************************************************************************
3555                                  ;* LDTXSI - THIS SUBROUTINE LOADS THE TX SILO (REGS 10,11) WITH THE DATA PASSED
3556                                  ;*       IN BITS 0-11 OF TXWORD.
3557                                  ;*****************************************************************************
3558  005174  013746  002400          LDTXSI: MOV     REGNUM,-(SP)    ;SAVE LU REG NO.
3559  005200  042737  170000  002422          BIC     #170000,TXWORD  ;CLEAR UNUSED BITS
3560  005206  012737  000011  002400          MOV     #11,REGNUM      ;SET REG NO. = 11
3561  005214  113737  002423  002366          MOVB    TXWORD+1,WRIBYT ;SET DATA TO BE WRITTEN INTO REG 11
3562  005222  004737  003750                  JSR     PC,WRITLU       ;LOAD DATA INTO REG 11
3563  005226  012737  000010  002400          MOV     #10,REGNUM      ;SET REG NO. = 10
3564  005234  113737  002422  002366          MOVB    TXWORD,WRIBYT   ;SET DATA TO BE WRITTEN INTO REG 10
3565  005242  004737  003750                  JSR     PC,WRITLU       ;LOAD DATA INTO REG 10
3566  005246  012637  002400                  MOV     (SP)+,REGNUM    ;RESTORE LU REG NO.
3567  005252  000207                          RTS     PC              ;RETURN
3568
3569
3570
3571
3572
3573                                  ;*****************************************************************************
3574                                  ;* STPLU - THIS SUBROUTINE CLOCKS THE LINE UNIT FOR THE NO. OF CYCLES PASSED
3575                                  ;*       IN BITS 0-14 OF THE WORD FOLLOWING THE CALL.
3576                                  ;*       IF BIT 15 = 1, A CHECK IS MADE TO DETERMINE IF THE USYRT CHIP TYPE
3577                                  ;*       REQUIRES DECREMENTING THE NO. OF CYCLES BY 1.
3578                                  ;*****************************************************************************
3579  005254  010146                  STPLU:  MOV     R1,-(SP)        ;SAVE R1
3580  005256  017601  000002                  MOV     @2(SP),R1       ;GET DESIRED NO. OF CYCLES
3581  005262  001426                          BEQ     6$              ;IF DESIRED CYCLES = 0, RETURN
3582  005264  100006                          BPL     2$              ;BR IF CHIP TYPE CHECK NOT NECESSARY
3583  005266  042701  100000                  BIC     #BIT15,R1       ;CLEAR FLAG BIT
3584  005272  005737  002430                  TST     CHPTYP          ;SEE IF SIG USYRT
3585  005276  001401                          BEQ     2$              ;BR IF YES
3586  005300  005301                          DEC     R1              ;DECREMENT CYCLE COUNT
3587  005302  152777  000010  175140  2$:     BISB    #LULOOP,@BSEL1  ;SET LU LOOP BIT
3588  005310  152777  000020  175132  3$:     BISB    #STEPLU,@BSEL1  ;SET THE STEPLU BIT (CLOCK THE TRANSMITTER)
3589  005316  004737  005164                  JSR     PC,STALL        ;STALL
3590  005322  142777  000020  175120          BICB    #STEPLU,@BSEL1  ;CLEAR THE STEPLU BIT (CLOCK THE RECEIVER)
3591  005330  004737  005164                  JSR     PC,STALL        ;STALL
```

```
3592  005334  005301                          DEC     R1              ;DECREMENT CYCLE COUNTER
3593  005336  001364                          BNE     3$              ;BR IF NOT DONE YET
3594  005340  062766  000002  000002  6$:     ADD     #2,2(SP)        ;FIX UP RETURN PC
3595  005346  012601                          MOV     (SP)+,R1        ;RESTORE R1
3596  005350  000207                          RTS     PC              ;RETURN
3597
3598
3599
3600
3601
3602                                  ;*************************************************************************************
3603                                  ;* OACTIV - THIS SUBROUTINE CHECKS FOR THE PROPER STATE OF OACT (REG 11) AND
3604                                  ;*      REPORTS AN ERROR IF IT IS NOT PROPERLY SET TO THE STATE OF BIT 0 IN THE
3605                                  ;*      WORD FOLLOWING THE CALL.
3606                                  ;*************************************************************************************
3607  005352  013746  002400          OACTIV: MOV     REGNUM,-(SP)    ;SAVE LU REG NO.
3608  005356  013746  002352                  MOV     SUBRPC,-(SP)
3609  005362  005737  002352                  TST     SUBRPC          ;SEE IF THIS IS A NESTED CALL
3610  005366  001006                          BNE     1$              ;BR IF YES
3611  005370  016637  000004  002352          MOV     4(SP),SUBRPC
3612  005376  162737  000004  002352          SUB     #4,SUBRPC       ;GET PC OF SUBROUTINE CALL
3613  005404  012737  000011  002400  1$:     MOV     #11,REGNUM      ;SET REG NO. = 11
3614  005412  004737  003672                  JSR     PC,READLU       ;READ REG 11
3615  005416  032776  000001  000004          BIT     #BIT0,@4(SP)    ;GET EXPECTED STATE OF OACT
3616  005424  001413                          BEQ     3$              ;BR IF EXPECTED OACT = 0
3617  005426  132737  000100  002364          BITB    #OACT,REDBYT    ;SEE IF OACT = 1
3618  005434  001031                          BNE     9$              ;BR IF OACT = 1
3619  005436  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
3620                                  ;REPORT OACT NOT SET
3621  005442                                  ERRDF   11,EM11,ERR4
 (4)  005442  104455                                                                     TRAP    C$ERDF
 (5)  005444  000013                                                                     .WORD   11
 (5)  005446  012472                                                                     .WORD   EM11
 (5)  005450  015624                                                                     .WORD   ERR4
3622  005452  000412                          BR      6$              ;TAKE ERROR RETURN
3623  005454  132737  000100  002364  3$:     BITB    #OACT,REDBYT    ;SEE IF OACT = 0
3624  005462  001416                          BEQ     9$              ;BR IF OACT = 0
3625  005464  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
3626                                  ;REPORT OACT NOT CLEARED
3627  005470                                  ERRDF   12,EM12,ERR4
 (4)  005470  104455                                                                     TRAP    C$ERDF
 (5)  005472  000014                                                                     .WORD   12
 (5)  005474  012507                                                                     .WORD   EM12
 (5)  005476  015624                                                                     .WORD   ERR4
3628  005500  016637  000002  002400  6$:     MOV     2(SP),REGNUM    ;RESTORE LU REG NO.
3629  005506  013706  002346                  MOV     PSTACK,SP       ;RESTORE PROGRAM STACK TO BASE LEVEL
3630  005512  013746  002362                  MOV     RETADR,-(SP)    ;FIX UP ERROR RETURN PC
3631  005516  000407                          BR      12$
3632  005520  062766  000002  000004  9$:     ADD     #2,4(SP)        ;FIX UP ERROR-FREE RETURN PC
3633  005526  012637  002352                  MOV     (SP)+,SUBRPC
3634  005532  012637  002400                  MOV     (SP)+,REGNUM    ;RESTORE LU REG NO.
3635  005536  000207                  12$:    RTS     PC              ;RETURN
3636
3637
3638
3639
```

```
3640
3641                                    ;*****************************************************************************
3642                                    ;* INITRN - THIS SUBROUTINE INITIATES TRANSMISSION OF A MESSAGE, BY DOING A
3643                                    ;*      MASTER CLEAR, LOADING AX2-15 AND REG 17 WITH THE DATA PASSED IN THE 2
3644                                    ;*      WORDS FOLLOWING THE CALL, LOADING 2 SOM CHARS INTO THE TX SILO, AND
3645                                    ;*      CLOCKING THE LINE UNIT UNTIL THE FIRST SYNCH OR FLAG HAS BEEN SERIALIZED
3646                                    ;*      IN THE USYRT. THE PROGRAM MONITORS ORDY,OCOR, AND OACT FOR VALID STATES,
3647                                    ;*      THROUGHOUT THE PROCESS.
3648                                    ;*      IF THE SUBROUTINE DETECTS AN ERROR, A RETURN IS MADE TO THE TEST, AT THE
3649                                    ;*      ADDRESS CONTAINED IN RETADR.
3650                                    ;*****************************************************************************
3651  005540  010146              INITRN: MOV     R1,-(SP)        ;SAVE R1
3652  005542  013746  002400              MOV     REGNUM,-(SP)    ;SAVE LU REG NO.
3653  005546  013746  002402              MOV     AXNUM,-(SP)     ;SAVE AX BYTE NO.
3654  005552  016637  000006  002352      MOV     6(SP),SUBRPC
3655  005560  162737  000004  002352      SUB     #4,SUBRPC       ;GET PC OF SUBR CALL
3656  005566  004737  003576              JSR     PC,MSTCLR       ;ISSUE A MASTER CLEAR
3657  005572  004737  004662              JSR     PC,OSIRDY       ;CHECK ORDY=1, OCOR=0
3658  005576  000001                      1
3659  005600  004737  005352              JSR     PC,OACTIV       ;CHK OACT=0
3660  005604  000000                      0
3661  005606  012737  000004  002402      MOV     #4,AXNUM        ;SET AX BYTE NO. = 4 FOR AX2
3662  005614  117637  000006  002374      MOVB    @6(SP),WAX15    ;SET DATA BYTE TO LOAD INTO AX2-15
3663  005622  012737  000400  002422      MOV     #TXSOM,TXWORD   ;SET TSOM BIT
3664  005630  113737  002374  002422      MOVB    WAX15,TXWORD    ;SET SYNCH CHAR
3665  005636  005037  002376              CLR     WAX16
3666  005642  004737  004312              JSR     PC,WRITAX       ;LOAD AX2
3667  005646  012737  000017  002400      MOV     #17,REGNUM      ;SET REG NO. = 17
3668  005654  062766  000002  000006      ADD     #2,6(SP)        ;INCR POINTER TO NEXT DATA BYTE
3669  005662  117637  000006  002366      MOVB    @6(SP),WRIBYT   ;SET DATA BYTE TO LOAD INTO REG 17
3670  005670  004737  003750              JSR     PC,WRITLU       ;LOAD REG 17
3671  005674  004737  005174              JSR     PC,LDTXSI       ;LOAD THE SILO WITH SOM CHAR
3672  005700  004737  005174              JSR     PC,LDTXSI       ;LOAD ANOTHER SOM INTO SILO
3673  005704  004737  005146              JSR     PC,WAIT50       ;WAIT FOR DATA TO RIPPLE
3674  005710  004737  004662              JSR     PC,OSIRDY       ;CHK ORDY=1, OCOR=1
3675  005714  000003                      3
3676  005716  004737  005352              JSR     PC,OACTIV       ;CHK FOR OACT = 0
3677  005722  000000                      0
3678  005724  005001                      CLR     R1              ;INIT CYCLE COUNTER
3679  005726  012737  000011  002400      MOV     #11,REGNUM      ;SET LU REG NO. = 11
3680  005734  152777  000010  174506  6$: BISB    #LULOOP,@BSEL1  ;SET LINE UNIT LOOP BIT
3681  005742  152777  000020  174500      BISB    #STEPLU,@BSEL1  ;SET CLOCK BIT
3682  005750  004737  005164              JSR     PC,STALL        ;STALL FOR MICRO-SEC
3683  005754  004737  003672              JSR     PC,READLU       ;READ REG 11
3684  005760  132737  000100  002364      BITB    #OACT,REDBYT    ;SEE IF OACT = 1 YET
3685  005766  001014                      BNE     9$              ;BR IF OACT = 1
3686  005770  142777  000020  174452      BICB    #STEPLU,@BSEL1  ;CLEAR CLOCK BIT
3687  005776  004737  005164              JSR     PC,STALL        ;STALL FOR A MICRO-SEC
3688  006002  005201                      INC     R1              ;INCR CYCLE COUNT
3689  006004  020127  000003              CMP     R1,#3           ;SEE IF 3 CYCLES DONE YET
3690  006010  002751                      BLT     6$              ;BR IF NOT
3691  006012  004737  005352              JSR     PC,OACTIV       ;CHK FOR OACT = 1
3692  006016  000001                      1
3693  006020  012737  000017  002400  9$: MOV     #17,REGNUM      ;SET REG NO. = 17
3694  006026  005037  002430              CLR     CHPTYP          ;CLEAR USYRT CHIP INDICATOR
3695  006032  004737  003672              JSR     PC,READLU       ;READ REG 17
```

```
3696  006036  132737  000020  002364          BITB    #OCOR,REDBYT    ;CHK FOR OCOR CLEARED YET
3697  006044  001403                          BEQ     12$             ;BR IF YES - IT IS SIG CHIP
3698  006046  012737  000001  002430          MOV     #1,CHPTYP       ;SET INDICATOR FOR OTHER CHIP TYPE
3699  006054  142777  000020  174366  12$:    BICB    #STEPLU,@BSEL1  ;CLEAR CLOCK BIT
3700  006062  004737  005164                  JSR     PC,STALL        ;STALL FOR MICRO-SEC
3701  006066  004737  004662                  JSR     PC,OSIRDY       ;CHK FOR ORDY = 1, OCOR = 0
3702  006072  000001                          1
3703  006074  062766  000002  000006          ADD     #2,6(SP)        ;FIX UP RETURN PC
3704  006102  012637  002402                  MOV     (SP)+,AXNUM     ;RESTORE AX BYTE NO.
3705  006106  012637  002400                  MOV     (SP)+,REGNUM    ;RESTORE LU REG NO.
3706  006112  012601                          MOV     (SP)+,R1        ;RESTORE R1
3707  006114  005037  002352                  CLR     SUBRPC          ;CLEAR SUBR CALL PC
3708  006120  000207                          RTS     PC              ;RETURN
3709
3710
3711
3712
3713
3714                                  ;*****************************************************************************
3715                                  ;* TXCHAR - THIS SUBROUTINE INITIATES TRANSMISSION OF A CHARACTER, BY LOADING
3716                                  ;*      THE TX SILO WITH DATA PASSED IN BITS 0-11 OF THE WORD FOLLOWING THE CALL
3717                                  ;*      AND CLOCKS THE LINE UNIT WITH THE NUMBER OF CYCLES PASSED IN BITS 0-14
3718                                  ;*      OF THE SECOND WORD FOLLOWING THE CALL. IF BIT 15 = 1, A CHK IS MADE TO
3719                                  ;*      DETERMINE IF THE USYRT CHIP TYPE REQUIRES DECREMENTING THE NO. OF CYCLES
3720                                  ;*      BY 1. THE PROGRAM CHECKS FOR VALID STATES OF ORDY,
3721                                  ;*      OCOR, AND OACT THROUGHOUT THE PROCESS.
3722                                  ;*      IF AN ERROR IS DETECTED, A RETURN IS MADE TO THE TEST, AT THE ADDRESS
3723                                  ;*      CONTAINED IN RETADR.
3724                                  ;*****************************************************************************
3725  006122  010146                  TXCHAR: MOV     R1,-(SP)        ;SAVE R1
3726  006124  010246                          MOV     R2,-(SP)        ;SAVE R2
3727  006126  016637  000004  002352          MOV     4(SP),SUBRPC
3728  006134  162737  000004  002352          SUB     #4,SUBRPC       ;GET PC OF SUBR CALL
3729  006142  017637  000004  002422          MOV     @4(SP),TXWORD   ;GET DATA TO BE TRANSMITTED
3730  006150  004737  005174                  JSR     PC,LDTXSI       ;LOAD THE TX SILO WITH THE DATA
3731  006154  004737  005146                  JSR     PC,WAIT50       ;WAIT FOR DATA TO RIPPLE DOWN SILO
3732  006160  062766  000002  000004          ADD     #2,4(SP)        ;INCR POINTER
3733  006166  005001                          CLR     R1              ;INIT CYCLE COUNT
3734  006170  017602  000004                  MOV     @4(SP),R2       ;GET DESIRED NO. OF CYCLES
3735  006174  005702                          TST     R2              ;SEE IF CHIP TYPE CHK SHOULD BE MADE
3736  006176  100006                          BPL     9$              ;BR IF NOT
3737  006200  042702  100000                  BIC     #BIT15,R2       ;CLEAR FLAG BIT
3738  006204  005737  002430                  TST     CHPTYP          ;SEE IF SIG USYRT
3739  006210  001401                          BEQ     9$              ;BR IF YES
3740  006212  005302                          DEC     R2              ;DECREMENT NO. OF CYCLES
3741  006214  004737  005352          9$:     JSR     PC,OACTIV       ;CHK OACT = 1
3742  006220  000001                          1
3743  006222  020102                          CMP     R1,R2           ;SEE IF REQUIRED CYCLES DONE YET
3744  006224  001410                          BEQ     12$             ;BR IF YES
3745  006226  004737  004662                  JSR     PC,OSIRDY       ;CHK ORDY=1, OCOR=1
3746  006232  000003                          3
3747  006234  004737  005254                  JSR     PC,STPLU        ;STEP LU ONE CYCLE
3748  006240  000001                          1
3749  006242  005201                          INC     R1              ;INCR CYCLE COUNT
3750  006244  000763                          BR      9$
3751  006246  004737  004662          12$:    JSR     PC,OSIRDY       ;CHK ORDY=1, OCOR=0
```

```
006252  000001                          1
006254  062766  000002  000004          ADD     #2,4(SP)          ;FIX UP RETURN PC
006262  005037  002352                  CLR     SUBRPC            ;CLEAR SUBR CALL PC
006266  012602                          MOV     (SP)+,R2          ;RESTORE R2
006270  012601                          MOV     (SP)+,R1          ;RESTORE R1
006272  000207                          RTS     PC                ;RETURN






                                ;*******************************************************************************
                                ;* ENDTRN - THIS SUBROUTINE CLEARS THE TRANSMITTER BY SETTING OC. THE PROGRAM
                                ;*       WAITS FOR 50 US, AND CHECKS FOR ORDY=1, OCOR=0, OACT=0, RTS=0.
                                ;*******************************************************************************
006274  010146                  ENDTRN: MOV     R1,-(SP)          ;SAVE R1
006276  013746  002400                  MOV     REGNUM,-(SP)      ;SAVE LU REG NO.
006302  016637  000004  002352          MOV     4(SP),SUBRPC
006310  162737  000004  002352          SUB     #4,SUBRPC         ;GET PC OF SUBROUTINE CALL
006316  012737  000011  002400          MOV     #11,REGNUM        ;SET LU REG NO. = 11
006324  012737  000200  002366          MOV     #OC,WRIBYT        ;SET OC IN DATA
006332  004737  003750                  JSR     PC,WRITLU         ;SET OC IN REG 11
006336  004737  005146                  JSR     PC,WAIT50         ;STALL FOR >50 US.
006342  004737  004662                  JSR     PC,OSIRDY         ;CHK ORDY=1, OCOR=0
006346  000001                          1
006350  004737  005352                  JSR     PC,OACTIV         ;CHK OACT = 0
006354  000000                          0
006356  012737  000013  002400          MOV     #13,REGNUM        ;SET REG NO. = 13
006364  004737  003672                  JSR     PC,READLU         ;READ REG 13
006370  032737  000040  002364          BIT     #RTS,REDBYT       ;CHK FOR RTS = 0
006376  001406                          BEQ     3$                ;BR IF RTS = 0
006400  004737  004526                  JSR     PC,GETALL         ;GET REGS FOR PRINTOUT
                                ;REPORT RTS NOT CLEARED
006404                                  ERRDF   65,EM65,ERR4
(4) 006404  104455                                                                  TRAP    C$ERDF
(5) 006406  000101                                                                  .WORD   65
(5) 006410  014246                                                                  .WORD   EM65
(5) 006412  015624                                                                  .WORD   ERR4
006414  005037  002352          3$:     CLR     SUBRPC            ;CLEAR SUBR CALL PC
006420  012637  002400                  MOV     (SP)+,REGNUM      ;RESTORE LU REG NO.
006424  012601                          MOV     (SP)+,R1          ;RESTORE R1
006426  000207                          RTS     PC                ;RETURN






                                ;*******************************************************************************
                                ;* ISIRDY - THIS SUBROUTINE CHECKS FOR THE PROPER STATES OF ICIR (REG 17)
                                ;*       AND IRDY (REG 12) AND REPORTS AN ERROR IF EITHER IS NOT PROPERLY SET
                                ;*       AS PASSED IN BIT 0 (ICIR) AND BIT 1 (IRDY) OF THE WORD FOLLOWING THE
                                ;*       CALL.
                                ;*       IF AN ERROR OCCURS, A RETURN IS MADE TO THE TEST AT THE ADDRESS
                                ;*       IN RETADR.
                                ;*******************************************************************************
006430  013746  002400          ISIRDY: MOV     REGNUM,-(SP)      ;SAVE LU REG NO.
```

```
3804  006434  013746  002352                  MOV     SUBRPC,-(SP)
3805  006440  005737  002352                  TST     SUBRPC          ;SEE IF THIS IS A NESTED CALL
3806  006444  001006                          BNE     1$              ;BR IF YES
3807  006446  016637  000004  002352          MOV     4(SP),SUBRPC
3808  006454  162737  000004  002352          SUB     #4,SUBRPC       ;GET PC OF SUBR CALL
3809  006462  012737  000012  002400  1$:     MOV     #12,REGNUM      ;SET REG NO. TO 12
3810  006470  004737  003672                  JSR     PC,READLU       ;READ REG 12
3811  006474  032776  000002  C0004           BIT     #BIT1,@4(SP)    ;GET EXPECTED STATE OF IRDY
3812  006502  001413                          BEQ     3$              ;BR IF EXPECTED IRDY = 0
3813  006504  132737  000020  002364          BITB    #IRDY,REDBYT    ;SEE IF IRDY = 1
3814  006512  001022                          BNE     9$              ;BR IF IRDY = 1
3815  006514  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
3816                                  ;REPORT IRDY NOT SET
3817  006520                                  ERRDF   17,EM17,ERR4
 (4)  006520  104455                                                                    TRAP    C$ERDF
 (5)  006522  000021                                                                    .WORD   17
 (5)  006524  012645                                                                    .WORD   EM17
 (5)  006526  015624                                                                    .WORD   ERR4
3818  006530  000451                          BR      16$             ;TAKE ERROR EXIT
3819  006532  132737  000020  002364  3$:     BITB    #IRDY,REDBYT    ;SEE IF IRDY = 0
3820  006540  001407                          BEQ     9$              ;BR IF IRDY = 0
3821  006542  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
3822                                  ;REPORT IRDY NOT CLEARED
3823  006546                                  ERRDF   18,EM18,ERR4
 (4)  006546  104455                                                                    TRAP    C$ERDF
 (5)  006550  000022                                                                    .WORD   18
 (5)  006552  012662                                                                    .WORD   EM18
 (5)  006554  015624                                                                    .WORD   ERR4
3824  006556  000436                          BR      16$             ;TAKE ERROR RETURN
3825  006560  012737  000017  002400  9$:     MOV     #17,REGNUM      ;SET REG NO. = 17
3826  006566  004737  003672                  JSR     PC,READLU       ;READ REG 17
3827  006572  132776  000001  000004          BITB    #BIT0,@4(SP)    ;GET EXPECTED STATE OF ICIR
3828  006600  001413                          BEQ     12$             ;BR IF EXPECTED ICIR = 0
3829  006602  132737  000010  002364          BITB    #ICIR,REDBYT    ;SEE IF ICIR = 1
3830  006610  001031                          BNE     20$             ;BR IF ICIR = 1
3831  006612  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
3832                                  ;REPORT ICIR NOT SET
3833  006616                                  ERRDF   19,EM19,ERR4
 (4)  006616  104455                                                                    TRAP    C$ERDF
 (5)  006620  000023                                                                    .WORD   19
 (5)  006622  012703                                                                    .WORD   EM19
 (5)  006624  015624                                                                    .WORD   ERR4
3834  006626  000412                          BR      16$             ;TAKE ERROR RETURN
3835  006630  132737  000010  002364  12$:    BITB    #ICIR,REDBYT    ;SEE IF ICIR = 0
3836  006636  001416                          BEQ     20$             ;BR IF ICIR = 0
3837  006640  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
3838                                  ;REPORT ICIR NOT CLEARED
3839  006644                                  ERRDF   20,EM20,ERR4
 (4)  006644  104455                                                                    TRAP    C$ERDF
 (5)  006646  000024                                                                    .WORD   20
 (5)  006650  012720                                                                    .WORD   EM20
 (5)  006652  015624                                                                    .WORD   ERR4
3840  006654  016637  000002  002400  16$:     MOV     2(SP),REGNUM    ;RESTORE LU REG NO.
3841  006662  013706  002346                  MOV     PSTACK,SP       ;RESTORE STACK POINTER TO BASE LEVEL
3842  006666  013746  002362                  MOV     RETADR,-(SP)    ;FIX ERROR RETURN PC
3843  006672  000407                          BR      23$
```

```
     006674  062766  000002  000004  20$:    ADD     #2,4(SP)          ;FIX UP ERROR-FREE RETURN PC
     006702  012637  002352                  MOV     (SP)+,SUBRPC
     006706  012637  002400                  MOV     (SP)+,REGNUM      ;RESTORE LU REG NO.
     006712  000207                  23$:    RTS     PC                ;RETURN





                                     ;**************************************************************************
                                     ;* IACTIV - THIS SUBROUTINE CHECKS FOR THE PROPER STATE OF IACT (REG 12) AND
                                     ;*         REPORTS AN ERROR IF IT IS NOT PROPERLY SET TO THE STATE OF BIT 0 IN THE
                                     ;*         WORD FOLLOWING THE CALL.
                                     ;*         IF AN ERROR OCCURS, A RETURN IS MADE TO THE TEST AT THE ADDRESS IN
                                     ;*         RETADR.
                                     ;**************************************************************************
     006714  013746  002400          IACTIV: MOV     REGNUM,-(SP)      ;SAVE LU REG NO.
     006720  013746  002352                  MOV     SUBRPC,-(SP)
     006724  005737  002352                  TST     SUBRPC            ;SEE IF THIS IS A NESTED CALL
     006730  001006                          BNE     1$                ;BR IF YES
     006732  016637  000004  002352          MOV     4(SP),SUBRPC
     006740  162737  000004  002352          SUB     #4,SUBRPC         ;GET PC OF SUBR CALL
     006746  012737  000012  002400  1$:     MOV     #12,REGNUM        ;SET REG NO. = 12
     006754  004737  003672                  JSR     PC,READLU         ;READ REG 12
     006760  032776  000001  000004          BIT     #BIT0,@4(SP)      ;GET EXPECTED STATE OF IACT
     006766  001413                          BEQ     3$                ;BR IF EXPECTED IACT = 0
     006770  132737  000100  002364          BITB    #IACT,REDBYT      ;SEE IF IACT = 1
     006776  001031                          BNE     9$                ;BR IF IACT = 1
     007000  004737  004526                  JSR     PC,GETALL         ;GET REGS FOR PRINTOUT
                                     ;REPORT IACT NOT SET
     007004                                  ERRDF   21,EM21,ERR4
 (4) 007004  104455                                                                  TRAP    C$ERDF
 (5) 007006  000025                                                                  .WORD   21
 (5) 007010  012741                                                                  .WORD   EM21
 (5) 007012  015624                                                                  .WORD   ERR4
     007014  000412                          BR      6$                ;TAKE ERROR EXIT
     007016  132737  000100  002364  3$:     BITB    #IACT,REDBYT      ;SEE IF IACT = 0
     007024  001416                          BEQ     9$                ;BR IF IACT = 0
     007026  004737  004526                  JSR     PC,GETALL         ;GET REGS FOR PRINTOUT
                                     ;REPORT IACT NOT CLEARED
     007032                                  ERRDF   22,EM22,ERR4
 (4) 007032  104455                                                                  TRAP    C$ERDF
 (5) 007034  000026                                                                  .WORD   22
 (5) 007036  012756                                                                  .WORD   EM22
 (5) 007040  015624                                                                  .WORD   ERR4
     007042  016637  000002  002400  6$:     MOV     2(SP),REGNUM      ;RESTORE LU REG NO.
     007050  013706  002346                  MOV     PSTACK,SP         ;RESTORE PROGRAM STACK TO BASE LEVEL
     007054  013746  002362                  MOV     RETADR,-(SP)      ;FIX UP ERROR RETURN PC
     007060  000407                          BR      12$
     007062  062766  000002  000004  9$:     ADD     #2,4(SP)          ;FIX UP ERROR-FREE RETURN PC
     007070  012637  002352                  MOV     (SP)+,SUBRPC
     007074  012637  002400                  MOV     (SP)+,REGNUM      ;RESTORE LU REG NO.
     007100  000207                  12$:    RTS     PC                ;RETURN
```

```
3892
3893
3894                                    ;*****************************************************************************
3895                                    ;* RSEOM - THIS SUBROUTINE CHECKS FOR THE PROPER STATES OF RSOM AND REOM IN
3896                                    ;* AX0-16, AND REPORTS AN ERROR IF EITHER IS NOT SET TO THE STATE PASSED IN BITS
3897                                    ;* 0,1, RESPECTIVELY, OF THE WORD FOLLOWING THE CALL.
3898                                    ;* IF AN ERROR OCCURS, A RETURN IS MADE TO THE TEST AT THE ADDRESS IN RETADR.
3899                                    ;*****************************************************************************
3900  007102  013746  002402           RSEOM:  MOV     AXNUM,-(SP)     ;SAVE AX BYTE NO.
3901  007106  013746  002352                   MOV     SUBRPC,-(SP)
3902  007112  005737  002352                   TST     SUBRPC          ;SEE IF THIS IS A NESTED CALL
3903  007116  001006                           BNE     1$              ;BR IF YES
3904  007120  016637  000004  002352           MOV     4(SP),SUBRPC
3905  007126  162737  000004  002352           SUB     #4,SUBRPC       ;GET PC OF SUBR CALL
3906  007134  012737  000001  002402   1$:     MOV     #1,AXNUM        ;SET AX BYTE NO. FOR AX0-16
3907  007142  004737  004124                   JSR     PC,READAX       ;READ AX0
3908  007146  032776  000001  000004           BIT     #BIT0,@4(SP)    ;GET EXPECTED STATE OF RSOM
3909  007154  001413                           BEQ     3$              ;BR IF EXPECTED RSOM = 0
3910  007156  132737  000001  002372           BITB    #RSOM,RAX16     ;SEE IF RSOM = 1
3911  007164  001022                           BNE     9$              ;BR IF RSOM = 1
3912  007166  004737  004526                   JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
3913                                    ;REPORT RSOM NOT SET
3914  007172                                    ERRDF   29,EM29,ERR6
  (4) 007172  104455                                                                TRAP    C$ERDF
  (5) 007174  000035                                                                .WORD   29
  (5) 007176  013175                                                                .WORD   EM29
  (5) 007200  017014                                                                .WORD   ERR6
3915  007202  000444                           BR      16$             ;TAKE ERROR EXIT
3916  007204  132737  000001  002372   3$:     BITB    #RSOM,RAX16     ;SEE IF RSOM = 0
3917  007212  001407                           BEQ     9$              ;BR IF RSOM = 0
3918  007214  004737  004526                   JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
3919                                    ;REPORT RSOM NOT CLEARED
3920  007220                                    ERRDF   28,EM28,ERR6
  (4) 007220  104455                                                                TRAP    C$ERDF
  (5) 007222  000034                                                                .WORD   28
  (5) 007224  013154                                                                .WORD   EM28
  (5) 007226  017014                                                                .WORD   ERR6
3921  007230  000431                           BR      16$             ;TAKE ERROR RETURN
3922  007232  132776  000002  000004   9$:     BITB    #BIT1,@4(SP)    ;GET EXPECTED STATE OF REOM
3923  007240  001413                           BEQ     12$             ;BR IF EXPECTED REOM = 0
3924  007242  132737  000002  002372           BITB    #REOM,RAX16     ;SEE IF REOM = 1
3925  007250  001031                           BNE     20$             ;BR IF REOM = 1
3926  007252  004737  004526                   JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
3927                                    ;REPORT REOM NOT SET
3928  007256                                    ERRDF   31,EM31,ERR6
  (4) 007256  104455                                                                TRAP    C$ERDF
  (5) 007260  000037                                                                .WORD   31
  (5) 007262  013233                                                                .WORD   EM31
  (5) 007264  017014                                                                .WORD   ERR6
3929  007266  000412                           BR      16$             ;TAKE ERROR RETURN
3930  007270  132737  000002  002372   12$:    BITB    #REOM,RAX16     ;SEE IF REOM = 0
3931  007276  001416                           BEQ     20$             ;BR IF REOM = 0
3932  007300  004737  004526                   JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
3933                                    ;REPORT REOM NOT CLEARED
3934  007304                                    ERRDF   30,EM30,ERR6
  (4) 007304  104455                                                                TRAP    C$ERDF
```

```
 (5)  007306  000036                                                          .WORD   30
 (5)  007310  013212                                                          .WORD   EM30
 (5)  007312  017014                                                          .WORD   ERR6
3935  007314  016637  000002  002402  16$:    MOV     2(SP),AXNUM     ;RESTORE AX BYTE NO.
3936  007322  013706  002346                  MOV     PSTACK,SP       ;RESTORE STACK POINTER TO BASE LEVEL
3937  007326  013746  002362                  MOV     RETADR,-(SP)    ;FIX ERROR RETURN PC
3938  007332  000407                          BR      23$
3939  007334  062766  000002  000004  20$:    ADD     #2,4(SP)        ;FIX UP ERROR-FREE RETURN PC
3940  007342  012637  002352                  MOV     (SP)+,SUBRPC
3941  007346  012637  002402                  MOV     (SP)+,AXNUM     ;RESTORE AX BYTE NO.
3942  007352  000207                  23$:    RTS     PC              ;RETURN
3943
3944
3945
3946
3947
3948                                  ;*****************************************************************************
3949                                  ;* RDRXSI - THIS SUBROUTINE READS THE RCV SILO (REGS 10,12) AND RETURNS THE
3950                                  ;*       SILO ENTRY IN BITS 0-11 OF RXWORD.
3951                                  ;*****************************************************************************
3952  007354  013746  002400          RDRXSI: MOV     REGNUM,-(SP)    ;SAVE LU REG NO.
3953  007360  012737  000012  002400          MOV     #12,REGNUM      ;SET REG NO. = 12
3954  007366  004737  003672                  JSR     PC,READLU       ;READ LU REG 12
3955  007372  113737  002364  002425          MOVB    REDBYT,RXWORD+1 ;GET HI BITS OF SILO ENTRY
3956  007400  042737  170000  002424          BIC     #170000,RXWORD  ;CLEAR UNUSED BITS
3957  007406  012737  000010  002400          MOV     #10,REGNUM      ;SET REG NO. = 10
3958  007414  004737  003672                  JSR     PC,READLU       ;READ REG 10
3959  007420  113737  002364  002424          MOVB    REDBYT,RXWORD   ;GET LOW BITS OF SILO ENTRY
3960  007426  012637  002400                  MOV     (SP)+,REGNUM    ;RESTORE LU REG NO.
3961  007432  000207                          RTS     PC              ;RETURN
3962
3963
3964
3965
3966
3967                                  ;*****************************************************************************
3968                                  ;* RCV1ST - THIS SUBROUTINE RECEIVES THE FIRST CHAR OF A MESSAGE, AND MONITORS
3969                                  ;*       STATUS OF THE RECEIVER. FIRST, A CHECK IS MADE FOR IACT = 0, IRDY = 0,
3970                                  ;*       ICIR = 1, AND RSOM = 0. THEN, THE LINE UNIT IS CLOCKED USING
3971                                  ;*       STEPLU UNTIL IRDY = 1. THE PROGRAM CHECKS FOR THIS TO OCCUR WITHIN 3
3972                                  ;*       CYCLES AFTER THE NO. OF CYCLES PASSED IN THE WORD FOLLOWING THE CALL.
3973                                  ;*       IF AN ERROR OCCURS, A RETURN IS MADE TO THE TEST, AT THE ADDRESS
3974                                  ;*       CONTAINED IN RETADR.
3975                                  ;*****************************************************************************
3976  007434  010146                  RCV1ST: MOV     R1,-(SP)        ;SAVE R1
3977  007436  010346                          MOV     R3,-(SP)        ;SAVE R3
3978  007440  013746  002400                  MOV     REGNUM,-(SP)    ;SAVE LU REG NO.
3979  007444  016637  000006  002352          MOV     6(SP),SUBRPC
3980  007452  162737  000004  002352          SUB     #4,SUBRPC       ;GET PC OF SUBROUTINE CALL
3981  007460  012737  000012  002400          MOV     #12,REGNUM      ;SET LU REG NO. = 12
3982  007466  005001                          CLR     R1              ;INIT CYCLE COUNT TO 0
3983  007470  017603  000006                  MOV     @6(SP),R3       ;GET CYCLE COUNT LIMIT
3984  007474  062703  000003                  ADD     #3,R3
3985  007500  005776  000006                  TST     @6(SP)          ;SEE IF DESIRED CYCLES = 0
3986  007504  001414                          BEQ     8$              ;BR IF YES
3987  007506  004737  006714                  JSR     PC,IACTIV       ;CHK FOR IACT = 0
```

```
                                                0
                                        JSR     PC,ISIRDY       ;CHK FOR ICIR = 1, IRDY = 0
                                                1
                                        JSR     PC,RSEOM        ;CHK RSOM = 0, REOM = 0 IN AX0-16
                                                0
                                6$:     JSR     PC,STPLU        ;CLOCK LU FOR 1 CYCLE
                                                1
                                8$:     JSR     PC,WAIT50       ;ALLOW SILO DATA TO RIPPLE
                                        INC     R1              ;INCREMENT CYCLE COUNT
                                        JSR     PC,READLU       ;READ REG 12
                                        BITB    #IRDY,REDBYT    ;SEE IF IRDY = 1 YET
                                        BNE     9$              ;BR IF IRDY = 1
                                        CMP     R1,R3           ;SEE IF LIMIT EXCEEDED
                                        BLT     6$              ;BR IF NOT YET
                                        JSR     PC,ISIRDY       ;CHK FOR ICIR = 1, IRDY = 1
                                                3
                                9$:     CMP     R1,@6(SP)       ;SEE IF LESS THAN REQUIRED CYCLES
                                        BGE     12$             ;BR IF NOT
                                        JSR     PC,ISIRDY       ;CHK FOR ICIR = 1, IRDY = 0
                                                1
                                12$:    JSR     PC,IACTIV       ;CHK FOR IACT = 1
                                                1
                                        JSR     PC,ISIRDY       ;CHK FOR ICIR = 1, IRDY = 1
                                                3
                                        ADD     #2,6(SP)        ;FIX UP RETURN PC
                                        MOV     (SP)+,REGNUM    ;RESTORE LU REG NO.
                                        MOV     (SP)+,R3        ;RESTORE R3
                                        MOV     (SP)+,R1        ;RESTORE R1
                                        CLR     SUBRPC          ;CLEAR SUBR CALL PC
                                        RTS     PC              ;RETURN


;*******************************************************************************************
;* STPERR - THIS SUBROUTINE LOADS THE CONTENTS OF THE FIRST WORD FOLLOWING THE
;*      CALL INTO REG 17, AND SETS THE IERR BIT, AND CLOCKS THE LINE UNIT
;*      FOR THE NO. OF CYCLES PASSED IN THE 2ND WORD FOLLOWING THE CALL. THEN,
;*      IT RESTORES REG 17 TO ITS ORIGINAL CONTENTS, CLEARING THE IERR BIT.
;*******************************************************************************************
STPERR: MOV     REGNUM,-(SP)    ;SAVE LU REG NO.
        MOV     #17,REGNUM      ;SET LU REG NO. = 17
        MOV     @2(SP),WRIBYT
        BISB    #IERR,WRIBYT
        JSR     PC,WRITLU       ;SET IERR BIT IN REG 17
        ADD     #2,2(SP)        ;INCREMENT SUBR ARGUMENT POINTER
        MOV     @2(SP),3$       ;GET DESIRED NO. OF CYCLES
        JSR     PC,STPLU        ;CLOCK LU FOR DESIRED NO. OF CYCLES
3$:     .WORD   0               ;NO. OF CYCLES GOES HERE
        BICB    #IERR,WRIBYT
        JSR     PC,WRITLU       ;CLEAR IERR BIT IN REG 17
        ADD     #2,2(SP)        ;FIX UP RETURN PC
        MOV     (SP)+,REGNUM    ;RESTORE LU REG NO.
        RTS     PC              ;RETURN
```

```
                                ;*****************************************************************************
                                ;* 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.
                                ;*****************************************************************************
007750  010146          CKDATA: MOV     R1,-(SP)        ;SAVE R1
007752  013746  002400          MOV     REGNUM,-(SP)    ;SAVE LU REG NO.
007756  016637  000004  002352  MOV     4(SP),SUBRPC
007764  162737  000004  002352  SUB     #4,SUBRPC       ;GET PC OF SUBR CALL
007772  017601  000004          MOV     @4(SP),R1       ;GET EXPECTED SILO ENTRY
007776  042701  170000          BIC     #170000,R1      ;CLEAR UNUSED BITS FOR COMPARE
010002  004737  007354          JSR     PC,RDRXSI       ;READ RCV SILO
010006  023727  002432  000347  CMP     SAVLEN,#TXLEN2!TXLEN1!TXLEN0!RXLEN2!RXLEN1!RXLEN0
010014  001005                  BNE     4$              ;BR IF CHAR LENGTH NOT = 7
010016  042701  000200          BIC     #BIT7,R1        ;MASK OFF BIT 8TH BIT
010022  042737  000200  002424  BIC     #BIT7,RXWORD
010030  120137  002424  4$:     CMPB    R1,RXWORD       ;COMPARE EXPECTED BITS 0-7 TO ACTUAL
010034  001445                  BEQ     6$              ;BR IF MATCH
010036  005037  002404          CLR     GOODAT
010042  110137  002404          MOVB    R1,GOODAT       ;GET EXPECTED DATA
010046  005037  002406          CLR     BADDAT
010052  113737  002424  002406  MOVB    RXWORD,BADDAT   ;GET ACTUAL DATA
010060  012737  000011  002400  MOV     #11,REGNUM      ;SET REG NO. = 11
010066  004737  003672          JSR     PC,READLU       ;READ REG 11
010072  132737  000001  002364  BITB    #UNRR,REDBYT    ;SEE IF TX UNDERRUN ERROR
010100  001410                  BEQ     5$              ;BR IF NOT
010102  004737  004526          JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                        ;REPORT TX UNDERRUN ERROR
010106                          ERRDF   54,EM54,ERR4
(4) 010106  104455                                                      TRAP    C$ERDF
(5) 010110  000066                                                      .WORD   54
(5) 010112  014210                                                      .WORD   EM54
(5) 010114  015624                                                      .WORD   ERR4
010116  000137  010600          JMP     36$             ;TAKE ERROR EXIT
010122  012737  000010  002400  5$:     MOV     #10,REGNUM      ;SET REG NO. = 10
010130  004737  004526          JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                        ;REPORT RCV'D DATA MISCOMPARE
010134                          ERRDF   34,EM34,ERR8
(4) 010134  104455                                                      TRAP    C$ERDF
(5) 010136  000042                                                      .WORD   34
(5) 010140  013322                                                      .WORD   EM34
(5) 010142  020124                                                      .WORD   ERR8
010144  000137  010600          JMP     36$             ;TAKE ERROR EXIT
010150  000301          6$:     SWAB    R1
010152  012737  000012  002400  MOV     #12,REGNUM      ;SET LU REG NO. FOR ERROR REPORTS
010160  120137  002425          CMPB    R1,RXWORD+1     ;COMPARE EXPECTED SILO BITS 8-11 TO ACTUAL
010164  001002                  BNE     7$              ;BR IF MISMATCH
010166  000137  010554          JMP     22$             ;CONTINUE
```

```
4092  010172  005037  002404          7$:     CLR     GOODAT
4093  010176  110137  002404                  MOVB    R1,GOODAT       ;SET EXPECTED DATA
4094  010202  005037  002406                  CLR     BADDAT
4095  010206  113737  002425  002406         MOVB    RXWORD+1,BADDAT ;SET ACTUAL DATA
4096  010214  032776  100000  000004         BIT     #BCCCHK,@4(SP)  ;SEE IF BCC SHOULD BE IGNORED
4097  010222  001433                         BEQ     10$             ;BR IF YES
4098  010224  132701  000001                 BITB    #BCC,R1         ;SEE IF EXPECTED BIT = 1
4099  010230  001014                         BNE     8$              ;BR IF YES
4100  010232  132737  000001  002425         BITB    #BCC,RXWORD+1   ;SEE IF ACTUAL BIT = 0
4101  010240  001424                         BEQ     10$             ;BR IF YES
4102  010242  004737  004526                 JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
4103                                 ;REPORT BCC NOT CLEARED
4104  010246                                 ERRDF   35,EM35,ERR8
  (4) 010246  104455                                                             TRAP    C$ERDF
  (5) 010250  000043                                                             .WORD   35
  (5) 010252  013350                                                             .WORD   EM35
  (5) 010254  020124                                                             .WORD   ERR8
4105  010256  000137  010600                 JMP     36$             ;TAKE ERROR EXIT
4106  010262  132737  000001  002425  8$:     BITB    #BCC,RXWORD+1   ;SEE IF ACTUAL BIT = 1
4107  010270  001010                         BNE     10$             ;BR IF YES
4108  010272  004737  004526                 JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
4109                                 ;REPORT BCC NOT SET
4110  010276                                 ERRDF   36,EM36,ERR8
  (4) 010276  104455                                                             TRAP    C$ERDF
  (5) 010300  000044                                                             .WORD   36
  (5) 010302  013370                                                             .WORD   EM36
  (5) 010304  020124                                                             .WORD   ERR8
4111  010306  000137  010600                 JMP     36$             ;TAKE ERROR EXIT
4112  010312                         10$:
4113  010312  132701  000002                 BITB    #EBLK,R1        ;SEE IF EXPECTED BIT = 1
4114  010316  001014                         BNE     12$             ;BR IF YES
4115  010320  132737  000002  002425         BITB    #EBLK,RXWORD+1  ;SEE IF ACTUAL BIT = 0
4116  010326  001424                         BEQ     14$             ;BR IF YES
4117  010330  004737  004526                 JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
4118                                 ;REPORT EBLK NOT CLEARED
4119  010334                                 ERRDF   37,EM37,ERR8
  (4) 010334  104455                                                             TRAP    C$ERDF
  (5) 010336  000045                                                             .WORD   37
  (5) 010340  013404                                                             .WORD   EM37
  (5) 010342  020124                                                             .WORD   ERR8
4120  010344  000137  010600                 JMP     36$             ;TAKE ERROR EXIT
4121  010350  132737  000002  002425  12$:     BITB    #EBLK,RXWORD+1  ;SEE IF ACTUAL BIT = 1
4122  010356  001010                         BNE     14$             ;BR IF YES
4123  010360  004737  004526                 JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
4124                                 ;REPORT EBLK NOT SET
4125  010364                                 ERRDF   38,EM38,ERR8
  (4) 010364  104455                                                             TRAP    C$ERDF
  (5) 010366  000046                                                             .WORD   38
  (5) 010370  013425                                                             .WORD   EM38
  (5) 010372  020124                                                             .WORD   ERR8
4126  010374  000137  010600                 JMP     36$             ;TAKE ERROR EXIT
4127  010400                         14$:
4128
4129  010400  132701  000004                 BITB    #RAB,R1         ;SEE IF EXPECTED BIT = 1
4130  010404  001014                         BNE     16$             ;BR IF YES
4131  010406  132737  000004  002425         BITB    #RAB,RXWORD+1   ;SEE IF ACTUAL BIT = 0
```

```
4132  010414  001424                          BEQ     18$             ;BR IF YES
4133  010416  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
4134                                  ;REPORT RAB NOT CLEARED
4135  010422                                  ERRDF   39,EM39,ERR8
 (4)  010422  104455                                                                    TRAP    C$ERDF
 (5)  010424  000047                                                                    .WORD   39
 (5)  010426  013442                                                                    .WORD   EM39
 (5)  010430  020124                                                                    .WORD   ERR8
4136  010432  000137  010600                  JMP     36$             ;TAKE ERROR EXIT
4137  010436  132737  000004  002425  16$:    BITB    #RAB,RXWORD+1   ;SEE IF ACTUAL BIT = 1
4138  010444  001010                          BNE     18$             ;BR IF YES
4139  010446  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
4140                                  ;REPORT RAB NOT SET
4141  010452                                  ERRDF   40,EM40,ERR8
 (4)  010452  104455                                                                    TRAP    C$ERDF
 (5)  010454  000050                                                                    .WORD   40
 (5)  010456  013462                                                                    .WORD   EM40
 (5)  010460  020124                                                                    .WORD   ERR8
4142  010462  000137  010600                  JMP     36$             ;TAKE ERROR EXIT
4143  010466                          18$:
4144  010466  132701  000010                  BITB    #OVRR,R1        ;SEE IF EXPECTED BIT = 1
4145  010472  001014                          BNE     20$             ;BR IF YES
4146  010474  132737  000010  002425          BITB    #OVRR,RXWORD+1  ;SEE IF ACTUAL BIT = 0
4147  010502  001424                          BEQ     22$             ;BR IF YES
4148  010504  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
4149                                  ;REPORT OVRR NOT CLEARED
4150  010510                                  ERRDF   41,EM41,ERR8
 (4)  010510  104455                                                                    TRAP    C$ERDF
 (5)  010512  000051                                                                    .WORD   41
 (5)  010514  013476                                                                    .WORD   EM41
 (5)  010516  020124                                                                    .WORD   ERR8
4151  010520  000137  010600                  JMP     36$             ;TAKE ERROR EXIT
4152  010524  132737  000010  002425  20$:    BITB    #OVRR,RXWORD+1  ;SEE IF ACTUAL BIT = 1
4153  010532  001010                          BNE     22$             ;BR IF YES
4154  010534  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
4155                                  ;REPORT OVRR NOT SET
4156  010540                                  ERRDF   42,EM42,ERR8
 (4)  010540  104455                                                                    TRAP    C$ERDF
 (5)  010542  000052                                                                    .WORD   42
 (5)  010544  013517                                                                    .WORD   EM42
 (5)  010546  020124                                                                    .WORD   ERR8
4157  010550  000137  010600                  JMP     36$             ;TAKE ERROR EXIT
4158  010554                          22$:
4159  010554  062766  000002  000004          ADD     #2,4(SP)        ;INCR SUBROUTINE ARGUMENT POINTER
4160  010562  017637  000004  010574          MOV     @4(SP),24$      ;GET DESIRED CYCLE COUNT
4161  010570  004737  005254                  JSR     PC,STPLU        ;CLOCK LU FOR DESIRED CYCLES
4162  010574  000000                  24$:    .WORD   0
4163  010576  000407                          BR      38$             ;TAKE ERROR-FREE EXIT
4164  010600  011637  002400          36$:    MOV     (SP),REGNUM     ;RESTORE LU REG NO.
4165  010604  013706  002346                  MOV     PSTACK,SP       ;RESTORE PROGRAM STACK TO BASE LEVEL
4166  010610  013746  002362                  MOV     RETADR,-(SP)    ;FIX UP ERROR RETURN PC
4167  010614  000406                          BR      40$
4168  010616  062766  000002  000004  38$:    ADD     #2,4(SP)        ;FIX UP ERROR-FREE RETURN PC
4169  010624  012637  002400                  MOV     (SP)+,REGNUM    ;RESTORE LU REG NO.
4170  010630  012601                          MOV     (SP)+,R1        ;RESTORE R1
4171  010632  005037  002352          40$:    CLR     SUBRPC          ;CLEAR SUBROUTINE PC
```

```
 4172  010636  000207                          RTS     PC              ;RETURN
 4173
 4174
 4175
 4176
 4177
 4178                                  ;*************************************************************************************
 4179                                  ;* SETUP - THIS SUBROUTINE LOADS THE FIRST WORD AFTER THE CALL INTO AX2-15
 4180                                  ;*       (SYNCH CHAR), LOADS THE SECOND WORD AFTER THE CALL INTO REG 17
 4181                                  ;*       LOADS THE THIRD WORD INTO AX3-15, AND LOADS THE FOURTH INTO AX3-16.
 4182                                  ;*************************************************************************************
 4183  010640  013746  002402         SETUP:  MOV     AXNUM,-(SP)     ;SAVE AX BYTE NO.
 4184  010644  013746  002400                 MOV     REGNUM,-(SP)    ;SAVE LU REG NO.
 4185  010650  012737  000004  002402         MOV     #4,AXNUM        ;SET AX BYTE NO. FOR AX2
 4186  010656  017637  000004  002374         MOV     @4(SP),WAX15
 4187  010664  005037  002376                 CLR     WAX16
 4188  010670  004737  004312                 JSR     PC,WRITAX       ;SET SYNCH CHAR IN AX2-15, CLEAR AX2-16
 4189  010674  012737  000017  002400         MOV     #17,REGNUM      ;SET LU REG NO. = 17
 4190  010702  062766  000002  000004         ADD     #2,4(SP)        ;INCREMENT ARGUMENT POINTER
 4191  010710  017637  000004  002366         MOV     @4(SP),WRIBYT
```

```
4193  010716  004737  003750                JSR     PC,WRITLU       ;LOAD REG 17
4194  010722  012737  000006  002402        MOV     #6,AXNUM        ;SET AX BYTE NO. FOR AX3
4195  010730  062766  000002  000004        ADD     #2,4(SP)        ;INCREMENT ARGUMENT POINTER
4196  010736  017637  000004  002374        MOV     @4(SP),WAX15
4197  010744  062766  000002  000004        ADD     #2,4(SP)        ;INCR ARGUMENT POINTER
4198  010752  017637  000004  002376        MOV     @4(SP),WAX16
4199  010760  013737  002376  002432        MOV     WAX16,SAVLEN    ;STORE TX AND RCV CHAR LENGTH
4200  010766  004737  004312                JSR     PC,WRITAX       ;LOAD AX3-15, AX3-16
4201  010772  062766  000002  000004        ADD     #2,4(SP)        ;FIX RETURN PC
4202  011000  012637  002400                MOV     (SP)+,REGNUM    ;RESTORE LU REG NO.
4203  011004  012637  002402                MOV     (SP)+,AXNUM     ;RESTORE AX BYTE NO.
4204  011010  005037  002352                CLR     SUBRPC          ;CLEAR SUBROUTINE PC STORAGE
4205  011014  000207                        RTS     PC              ;RETURN
4206
4207
4208
4209
4210
4211                                  ;*****************************************************************************
4212                                  ;* LODMSG - THIS SUBROUTINE LOADS THE NO. OF WORDS PASSED IN THE SECOND WORD
4213                                  ;*       FOLLOWING THE CALL FROM THE MSG BUFFER WHOSE ADDRESS IS IN THE FIRST
4214                                  ;*       WORD FOLLOWING THE CALL, INTO THE TRANSMITTER SILO.
4215                                  ;*****************************************************************************
4216  011016  010146                LODMSG: MOV     R1,-(SP)        ;SAVE R1
4217  011020  010246                        MOV     R2,-(SP)        ;SAVE R2
4218  011022  017601  000004                MOV     @4(SP),R1       ;GET MSG POINTER INTO R1
4219  011026  062766  000002  000004        ADD     #2,4(SP)        ;INCR ARG POINTER
4220  011034  017602  000004                MOV     @4(SP),R2       ;GET WORD COUNT INTO R2
4221  011040  062766  000002  000004        ADD     #2,4(SP)        ;FIX UP RETURN PC
4222  011046  012137  002422          6$:   MOV     (R1)+,TXWORD    ;GET NEXT MSG WORD
4223  011052  004737  005174                JSR     PC,LDTXSI       ;LOAD A WORD INTO TX SILO
4224  011056  005302                        DEC     R2              ;DECR COUNT
4225  011060  001372                        BNE     6$              ;BR IF NOT DONE YET
4226  011062  004737  005146                JSR     PC,WAIT50       ;WAIT FOR SILO TO RIPPLE
4227  011066  012602                        MOV     (SP)+,R2        ;RESTORE R2
4228  011070  012601                        MOV     (SP)+,R1        ;RESTORE R1
4229  011072  000207                        RTS     PC              ;RETURN
4230
4231
4232
4233
4234
4235                                  ;*****************************************************************************
4236                                  ;* RXCHAR - THIS SUBROUTINE READS THE RCV SILO AND CLOCKS THE LINE UNIT.
4237                                  ;*       FIRST, IT READS THE CHAR FROM THE RCV SILO, AND CHECKS FOR ICIR
4238                                  ;*       = 1, IRDY = 0. IT THEN CLOCKS THE LINE UNIT FOR THE NO. OF CYCLES
4239                                  ;*       PASSED IN THE WORD FOLLOWING THE CALL, AND THEN CHECKS FOR ICIR
4240                                  ;*       = 1, IRDY = 1.
4241                                  ;*****************************************************************************
4242  011074  010146                RXCHAR: MOV     R1,-(SP)        ;SAVE R1
4243  011076  016637  000002  002352        MOV     2(SP),SUBRPC
4244  011104  162737  000004  002352        SUB     #4,SUBRPC       ;GET PC OF SUBR CALL
4245  011112  004737  007354                JSR     PC,RDRXSI       ;READ RCV SILO
4246  011116  004737  005146                JSR     PC,WAIT50       ;ALLOW SILO TO RIPPLE
4247  011122  005001                        CLR     R1              ;INIT CYCLE COUNT
4248  011124  020176  000002          9$:   CMP     R1,@2(SP)       ;SEE IF REQUIRED CYCLES DONE YET
```

```
4249  011130  001410                          BEQ     12$             ;BR IF YES
4250  011132  004737  006430                  JSR     PC,ISIRDY       ;CHK ICIR = 1, IRDY = 0
4251  011136  000001                          1
4252  011140  004737  005254                  JSR     PC,STPLU        ;CLK LU 1 CYCLE
4253  011144  000001                          1
4254  011146  005201                          INC     R1              ;INCR CYCLE COUNT
4255  011150  000765                          BR      9$
4256  011152  004737  006430          12$:    JSR     PC,ISIRDY       ;CHK ICIR = 1 IRDY = 1
4257  011156  000003                          3
4258  011160  062766  000002  000002          ADD     #2,2(SP)        ;FIX RETURN PC
4259  011166  005037  002352                  CLR     SUBRPC          ;CLEAR SUBR CALL PC
4260  011172  012601                          MOV     (SP)+,R1        ;RESTORE R1
4261  011174  000207                          RTS     PC              ;RETURN
4262
4263
4264
4265
4266
4267                                  ;*****************************************************************************
4268                                  ;* CKTBIT - THIS SUBROUTINE CLOCKS THE LINE UNIT FOR 8 CYCLES, AND AFTER EACH
4269                                  ;*      CYCLE, THE TXDATA BIT IN REG 17 IS EXAMINED, AND COMPARED TO A BIT OF
4270                                  ;*      THE CHAR PASSED IN THE WORD FOLLOWING THE CALL.
4271                                  ;*      IF AN ERROR OCCURS, A RETURN IS MADE TO THE TEST AT THE ADDRESS IN
4272                                  ;*      RETADR.
4273                                  ;*****************************************************************************
4274  011176  013746  002400          CKTBIT: MOV     REGNUM,-(SP)    ;SAVE LU REG NO.
4275  011202  010146                          MOV     R1,-(SP)        ;SAVE R1
4276  011204  016637  000004  002352          MOV     4(SP),SUBRPC
4277  011212  162737  000004  002352          SUB     #4,SUBRPC       ;GET PC OF SUBROUTINE CALL
4278  011220  012701  000001                  MOV     #BIT0,R1        ;INIT BIT POINTER
4279  011224  012737  000017  002400          MOV     #17,REGNUM      ;SET REG NO. = 17
4280  011232  004737  005254          4$:     JSR     PC,STPLU        ;CLOCK LINE UNIT 1 CYCLE
4281  011236  000001                          1
4282  011240  004737  003672                  JSR     PC,READLU       ;READ REG 17
4283  011244  030176  000004                  BIT     R1,@4(SP)       ;SEE IF EXPECTED BIT = 1
4284  011250  001013                          BNE     9$              ;BR IF YES
4285  011252  132737  000040  002364          BITB    #TXDATA,REDBYT  ;SEE IF ACTUAL BIT = 0
4286  011260  001422                          BEQ     12$             ;BR IF YES
4287  011262  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
4288                                  ;REPORT TXDATA NOT CLEARED
4289  011266                                  ERRDF   32,EM32,ERR4
  (4) 011266  104455                                                                  TRAP    C$ERDF
  (5) 011270  000040                                                                  .WORD   32
  (5) 011272  013250                                                                  .WORD   EM32
  (5) 011274  015624                                                                  .WORD   ERR4
4290  011276  000420                          BR      20$             ;TAKE ERROR RETURN
4291  011300  132737  000040  002364  9$:     BITB    #TXDATA,REDBYT  ;SEE IF ACTUAL BIT = 1
4292  011306  001007                          BNE     12$             ;BR IF YES
4293  011310  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
4294                                  ;REPORT TXDATA BIT NOT SET
4295  011314                                  ERRDF   33,EM33,ERR4
  (4) 011314  104455                                                                  TRAP    C$ERDF
  (5) 011316  000041                                                                  .WORD   33
  (5) 011320  013277                                                                  .WORD   EM33
  (5) 011322  015624                                                                  .WORD   ERR4
4296  011324  000405                          BR      20$             ;TAKE ERROR EXIT
```

```
4297  011326  006301                    12$:    ASL     R1              ;SHIFT BIT POINTER
4298  011330  020127  000400                    CMP     R1,#400         ;SEE IF 8 BITS SCANNED YET
4299  011334  001336                            BNE     4$              ;BR IF NO
4300  011336  000405                            BR      22$
4301  011340  013706  002346            20$:    MOV     PSTACK,SP       ;RESTORE PROGRAM STACK POINTER TO BASE LEVEL
4302  011344  013746  002362                    MOV     RETADR,-(SP)    ;FIX UP RETURN PC
4303  011350  000406                            BR      40$
4304  011352  062766  000002  000004    22$:    ADD     #2,4(SP)        ;FIX UP ERROR-FREE RETURN PC
4305  011360  012601                            MOV     (SP)+,R1        ;RESTORE R1
4306  011362  012637  002400                    MOV     (SP)+,REGNUM    ;RESTORE REG NO.
4307  011366  005037  002352            40$:    CLR     SUBRPC          ;CLEAR SUBR CALL PC
4308  011372  000207                            RTS     PC              ;RETURN
4309
4310
4311
4312
4313
4314                                    ;*****************************************************************************
4315                                    ;* LDMSG1 - THIS SUBROUTINE LOADS THE TRANSMITTER SILO WITH MSG1, AND LOADS
4316                                    ;*      THE DATA CHARS INTO THE RCV MSG BUFFER (RCVBUF:), AS EXPECTED DATA
4317                                    ;*      FOR LATER COMPARISON.
4318                                    ;*****************************************************************************
4319  011374  010146                    LDMSG1: MOV     R1,-(SP)        ;SAVE R1
4320  011376  010246                            MOV     R2,-(SP)        ;SAVE R2
4321  011400  004737  011016                    JSR     PC,LODMSG       ;LOAD MSG1 INTO TX SILO
4322  011404  003220                            MSG1
4323  011406  000011                            9.
4324  011410  012701  003224                    MOV     #MSG1+4,R1      ;GET POINTER TO MSG1
4325  011414  012702  003262                    MOV     #RCVBUF,R2      ;GET POINTER TO MSG BUF
4326  011420  012122                    3$:     MOV     (R1)+,(R2)+     ;LOAD A CHAR INTO MSG BUF
4327  011422  020127  003236                    CMP     R1,#MSG1+14.    ;SEE IF DID LAST DATA CHAR YET
4328  011426  103774                            BLO     3$              ;BR IF NOT
4329  011430  052762  100400  177776          BIS     #CRCCHK!RXBCC,-2(R2) ;SET EXPECTED BCC
4330  011436  012726  000160                  MOV     #160,(SP)+      ;LOAD HI CRC BYTE
4331  011442  012726  000034                  MOV     #034,(SP)+      ;LOAD LO CRC BYTE
4332  011446  012602                          MOV     (SP)+,R2        ;RESTORE R2
4333  011450  012601                          MOV     (SP)+,R1        ;RESTORE R1
4334  011452  000207                          RTS     PC              ;RETURN
4335
4336
4337
4338
4339
```

```
                                .SBTTL  GLOBAL ERROR REPORT SECTION

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

 4349  011454 052045 047445 022466 FMT1:   .ASCIZ  /%T%06%N/
       011462 000116
 4350  011464 047045 040445 040506 FMT2:   .ASCIZ  /%N%AFAILING REG: /
       011472 046111 047111 020107
       011500 042522 035107 000040
 4351  011506 040445 054105 042520 FMT3:   .ASCIZ  /%AEXPECTED: %03%S5%AACTUAL: %03%N/
       011514 052103 042105 020072
       011522 047445 022463 032523
       011530 040445 041501 052524
       011536 046101 020072 047445
       011544 022463 000116
 4352  011550 047045 052045 047045 FMT4:   .ASCIZ  /%N%T%N%T%N/
       011556 052045 047045 000
 4353  011563 045 031517 051445 FMT5:   .ASCIZ  /%03%S5%03%S5%03%S5%03%N/
       011570 022465 031517 051445
       011576 022465 031517 051445
       011604 022465 031517 047045
       011612 000
 4354  011613 045 032123 047445 FMT6:   .ASCIZ  /%S4%03%S5%03%S5%03%S5%03%N/
       011620 022463 032523 047445
       011626 022463 032523 047445
       011634 022463 032523 047445
       011642 022463 000116
 4355  011646 052045 047445 022462 FMT7:   .ASCIZ  /%T%02%N/
       011654 000116
 4356  011656 040445 054105 042524 FMT8:   .ASCIZ  /%AEXTENDED REG AX%01%A-%T%N/
       011664 042116 042105 051040
       011672 043505 040440 022530
       011700 030517 040445 022455
       011706 022524 000116
 4357  011712 052045 047045 000 FMT9:   .ASCIZ  /%T%N/
 4358  011717 045 050101 020103 FMT10:  .ASCIZ  /%APC OF SUBR CALL: %06%N/
       011724 043117 051440 041125
       011732 020122 040503 046114
       011740 020072 047445 022466
       011746 000116
 4359  011750 040445 042522 020107 FMT11:  .ASCIZ  /%AREG %02%A LOADED WITH: %03%N/
       011756 047445 022462 020101
       011764 047514 042101 042105
       011772 053440 052111 035110
       012000 022440 031517 047045
       012006 000
 4360  012007 045 022516 052101 FMT19:  .ASCIZ  /%N%ATEST %D2%A NOT RUN%N/
       012014 051505 020124 042045
       012022 022462 020101 047516
       012030 020124 052522 022516
       012036 000116
 4361  012040 047045 040445 046120 FMT24:  .ASCIZ  /%N%APLEASE INSURE RUN SWITCH ON MICROPROCESSOR IS ON%N/
```

```
        012046  040505  042523  044440
        012054  051516  051125  020105
        012062  052522  020116  053523
        012070  052111  044103  047440
        012076  020116  044515  051103
        012104  050117  047522  042503
        012112  051523  051117  044440
        012120  020123  047117  047045
        012126     000
4362
4363
4364
4365    012127     103  051123  040440  EM1:    .ASCIZ  /CSR ADDRESS TIME-OUT (SEL0)/
        012134  042104  042522  051523
        012142  052040  046511  026505
        012150  052517  020124  051450
        012156  046105  024460     000
4366    012163     122  043505  047040  EM2:    .ASCIZ  /REG NOT INITIALIZED BY MST CLR/
        012170  052117  044440  044516
        012176  044524  046101  055111
        012204  042105  041040  020131
        012212  051515  020124  046103
        012220  000122
4367    012222  042522  020107  044515  EM3:    .ASCIZ  /REG MISCOMPARE/
        012230  041523  046517  040520
        012236  042522     000
4368    012241     122  043505  047040  EM4:    .ASCIZ  /REG NOT INITIALIZED BY UNIBUS RESET (INIT)/
        012246  052117  044440  044516
        012254  044524  046101  055111
        012262  042105  041040  020131
        012270  047125  041111  051525
        012276  051040  051505  052105
        012304  024040  047111  052111
        012312  000051
4369    012314  040515  047111  020124  EM5:    .ASCIZ  /MAINT CLK BIT STUCK AT 0/
        012322  046103  020113  044502
        012330  020124  052123  041525
        012336  020113  052101  030040
        012344     000
4370    012345     115  044501  052116  EM6:    .ASCIZ  /MAINT CLK BIT STUCK AT 1/
        012352  041440  045514  041040
        012360  052111  051440  052524
        012366  045503  040440  020124
        012374  000061
4371    012376  051117  054504  047040  EM7:    .ASCIZ  /ORDY NOT SET/
        012404  052117  051440  052105
        012412     000
4372    012413     117  042122  020131  EM8:    .ASCIZ  /ORDY NOT CLEARED/
        012420  047516  020124  046103
        012426  040505  042522  000104
4373    012434  041517  051117  047040  EM9:    .ASCIZ  /OCOR NOT SET/
        012442  052117  051440  052105
        012450     000
4374    012451     117  047503  020122  EM10:   .ASCIZ  /OCOR NOT CLEARED/
        012456  047516  020124  046103
        012464  040505  042522  000104
```

```
4375  012472  040517  052103  047040  EM11:   .ASCIZ  /OACT NOT SET/
      012500  052117  051440  052105
      012506     000
4376  012507     117  041501  020124  EM12:   .ASCIZ  /OACT NOT CLEARED/
      012514  047516  020124  046103
      012522  040505  042522  000104
4377  012530  047125  051122  047040  EM13:   .ASCIZ  /UNRR NOT CLEARED BY SOM/
      012536  052117  041440  042514
      012544  051101  042105  041040
      012552  020131  047523  000115
4378  012560  047125  051122  047040  EM14:   .ASCIZ  /UNRR NOT SET/
      012566  052117  051440  052105
      012574     000
4379  012575     125  051116  020122  EM15:   .ASCIZ  /UNRR NOT CLEARED BY OC/
      012602  047516  020124  046103
      012610  040505  042522  020104
      012616  054502  047440  000103
4380  012624  047125  051122  047040  EM16:   .ASCIZ  /UNRR NOT CLEARED/
      012632  052117  041440  042514
      012640  051101  042105     000
4381  012645     111  042122  020131  EM17:   .ASCIZ  /IRDY NOT SET/
      012652  047516  020124  042523
      012660  000124
4382  012662  051111  054504  047040  EM18:   .ASCIZ  /IRDY NOT CLEARED/
      012670  052117  041440  042514
      012676  051101  042105     000
4383  012703     111  044503  020122  EM19:   .ASCIZ  /ICIR NOT SET/
      012710  047516  020124  042523
      012716  000124
4384  012720  041511  051111  047040  EM20:   .ASCIZ  /ICIR NOT CLEARED/
      012726  052117  041440  042514
      012734  051101  042105     000
4385  012741     111  041501  020124  EM21:   .ASCIZ  /IACT NOT SET/
      012746  047516  020124  042523
      012754  000124
4386  012756  040511  052103  047040  EM22:   .ASCIZ  /IACT NOT CLEARED/
      012764  052117  041440  042514
      012772  051101  042105     000
4387  012777     104  051523  020111  EM23:   .ASCIZ  /DSSI NOT CLEARED/
      013004  047516  020124  046103
      013012  040505  042522  000104
4388  013020  051504  044523  047040  EM24:   .ASCIZ  /DSSI NOT SET/
      013026  052117  051440  052105
      013034     000
4389  013035     104  051523  020111  EM25:   .ASCIZ  /DSSI NOT CLEARED BY MST CLR/
      013042  047516  020124  046103
      013050  040505  042522  020104
      013056  054502  046440  052123
      013064  041440  051114     000
4390  013071     111  041516  051117  EM26:   .ASCIZ  /INCORRECT DATA CHAR RCV'D/
      013076  042522  052103  042040
      013104  052101  020101  044103
      013112  051101  051040  053103
      013120  042047     000
4391  013123     111  041516  051117  EM27:   .ASCIZ  /INCORRECT CRC BYTE RCV'D/
      013130  042522  052103  041440
```

```
                013136  041522  041040  052131
                013144  020105  041522  023526
                013152  000104
4392            013154  051522  046517  047040  EM28:   .ASCIZ  /RSOM NOT CLEARED/
                013162  052117  041440  042514
                013170  051101  042105     000
4393            013175     122  047523  020115  EM29:   .ASCIZ  /RSOM NOT SET/
                013202  047516  020124  042523
                013210  000124
4394            013212  042522  046517  047040  EM30:   .ASCIZ  /REOM NOT CLEARED/
                013220  052117  041440  042514
                013226  051101  042105     000
4395            013233     122  047505  020115  EM31:   .ASCIZ  /REOM NOT SET/
                013240  047516  020124  042523
                013246  000124
4396            013250  054124  040504  040524  EM32:   .ASCIZ  /TXDATA BIT NOT CLEARED/
                013256  041040  052111  047040
                013264  052117  041440  042514
                013272  051101  042105     000
4397            013277     124  042130  052101  EM33:   .ASCIZ  /TXDATA BIT NOT SET/
                013304  020101  044502  020124
                013312  047516  020124  042523
                013320  000124
4398            013322  041522  023526  020104  EM34:   .ASCIZ  /RCV'D DATA MISCOMPARE/
                013330  040504  040524  046440
                013336  051511  047503  050115
                013344  051101  000105
4399            013350  041502  020103  047516  EM35:   .ASCIZ  /BCC NOT CLEARED/
                013356  020124  046103  040505
                013364  042522  000104
4400            013370  041502  020103  047516  EM36:   .ASCIZ  /BCC NOT SET/
                013376  020124  042523  000124
4401            013404  041105  045514  047040  EM37:   .ASCIZ  /EBLK NOT CLEARED/
                013412  052117  041440  042514
                013420  051101  042105     000
4402            013425     105  046102  020113  EM38:   .ASCIZ  /EBLK NOT SET/
                013432  047516  020124  042523
                013440  000124
4403            013442  040522  020102  047516  EM39:   .ASCIZ  /RAB NOT CLEARED/
                013450  020124  046103  040505
                013456  042522  000104
4404            013462  040522  020102  047516  EM40:   .ASCIZ  /RAB NOT SET/
                013470  020124  042523  000124
4405            013476  053117  051122  047040  EM41:   .ASCIZ  /OVRR NOT CLEARED/
                013504  052117  041440  042514
                013512  051101  042105     000
4406            013517     117  051126  020122  EM42:   .ASCIZ  /OVRR NOT SET/
                013524  047516  020124  042523
                013532  000124
4407            013534  053523  050040  041501  EM43:   .ASCIZ  /SW PACK #1 INCORRECT/
                013542  020113  030443  044440
                013550  041516  051117  042522
                013556  052103     000
4408            013561     123  020127  040520  EM44:   .ASCIZ  /SW PACK #2 INCORRECT/
                013566  045503  021440  020062
                013574  047111  047503  051122
```

```
                013602  041505  000124
4409            013606  053523  050040  041501  EM45:   .ASCIZ  /SW PACK #3 INCORRECT/
                013614  020113  031443  044440
                013622  041516  051117  042522
                013630  052103     000
4410            013633     122  053103  051440  EM46:   .ASCIZ  /RCV SILO NOT CLEARED BY IC/
                013640  046111  020117  047516
                013646  020124  046103  040505
                013654  042522  020104  054502
                013662  044440  000103
4411            013666  051501  042523  041115  EM47:   .ASCIZ  /ASSEMB BIT COUNT INCORRECT/
                013674  041040  052111  041440
                013702  052517  052116  044440
                013710  041516  051117  042522
                013716  052103     000
4412            013721     117  042104  053040  EM48:   .ASCIZ  /ODD VRC PARITY BIT NOT SET/
                013726  041522  050040  051101
                013734  052111  020131  044502
                013742  020124  047516  020124
                013750  042523  000124
4413            013754  042117  020104  051126  EM49:   .ASCIZ  /ODD VRC PARITY BIT NOT CLEARED/
                013762  020103  040520  044522
                013770  054524  041040  052111
                013776  047040  052117  041440
                014004  042514  051101  042105
                014012     000
4414            014013     105  042526  020116  EM50:   .ASCIZ  /EVEN VRC PARITY BIT NOT SET/
                014020  051126  020103  040520
                014026  044522  054524  041040
                014034  052111  047040  052117
                014042  051440  052105     000
4415            014047     105  042526  020116  EM51:   .ASCIZ  /EVEN VRC PARITY BIT NOT CLEARED/
                014054  051126  020103  040520
                014062  044522  054524  041040
                014070  052111  047040  052117
                014076  041440  042514  051101
                014104  042105     000
4416            014107     122  040505  054504  EM52:   .ASCIZ  /READY NOT SET AFTER AX REG WRITE/
                014114  047040  052117  051440
                014122  052105  040440  052106
                014130  051105  040440  020130
                014136  042522  020107  051127
                014144  052111  000105
4417            014150  042522  042101  020131  EM53:   .ASCIZ  /READY NOT SET AFTER AX REG READ/
                014156  047516  020124  042523
                014164  020124  043101  042524
                014172  020122  054101  051040
                014200  043505  051040  040505
                014206  000104
4418            014210  054124  052440  042116  EM54:   .ASCIZ  /TX UNDERRUN ERROR/
                014216  051105  052522  020116
                014224  051105  047522  000122
4419            014232  052122  020123  047516  EM60:   .ASCIZ  /RTS NOT SET/
                014240  020124  042523  000124
4420            014246  052122  020123  047516  EM65:   .ASCIZ  /RTS NOT CLEARED/
                014254  020124  046103  040505
```

```
        014262  042522  000104
4421
4422
4423
4424    014266  047111  052502  027523  DH1:    .ASCIZ  &INBUS/OUTBUS REG &
        014274  052517  041124  051525
        014302  051040  043505  000040
4425    014310  044514  042516  052440  DH2:    .ASCIZ  /LINE UNIT INBUS REGS :/
        014316  044516  020124  047111
        014324  052502  020123  042522
        014332  051507  035040     000
4426    014337     122  043505  030061  DH3:    .ASCIZ  /REG10   REG11   REG12   REG13/
        014344  020040  051040  043505
        014352  030461  020040  051040
        014360  043505  031061  020040
        014366  051040  043505  031461
        014374     000
4427    014375     040  020040  051040  DH4:    .ASCIZ  /    REG14   REG15   REG16   REG17/
        014402  043505  032061  020040
        014410  051040  043505  032461
        014416  020040  051040  043505
        014424  033061  020040  051040
        014432  043505  033461     000
4428    014437     061  000065          DH5:    .ASCIZ  /15/
4429    014442  033061     000          DH6:    .ASCIZ  /16/
4430    014445     114  047111  020105  DH7:    .ASCIZ  /LINE UNIT EXTENDED REGS :/
        014452  047125  052111  042440
        014460  052130  047105  042504
        014466  020104  042522  051507
        014474  035040     000
4431    014477     101  030130  030455  DH8:    .ASCIZ  /AX0-15  AX0-16  AX1-15  AX1-16/
        014504  020065  040440  030130
        014512  030455  020066  040440
        014520  030530  030455  020065
        014526  040440  030530  030455
        014534  000066
4432    014536  020040  020040  054101  DH9:    .ASCIZ  /    AX2-15  AX2-16  AX3-15  AX3-16/
        014544  026462  032461  020040
        014552  054101  026462  033061
        014560  020040  054101  026463
        014566  032461  020040  054101
        014574  026463  033061     000
4433
4434            014602                  .EVEN
4435
4436
4437
4438
4439
4440    U14602                          BGNMSG  ERR1
  (3)   014602                                                          ERR1::
4441    014602                          PRINTB  #FMT1,#ADDRES,MPCSR
  (9)   014602  013746  002446                                                MOV     MPCSR,-(SP)
  (8)   014606  012746  035622                                                MOV     #ADDRES,-(SP)
  (7)   014612  012746  011454                                                MOV     #FMT1,-(SP)
  (6)   014616  012746  000003                                                MOV     #3,-(SP)
```

```
  (3)  014622  010600                                                    MOV     SP,R0
  (4)  014624  104414                                                    TRAP    C$PNTB
  (4)  014626  062706  000010                                            ADD     #10,SP
4442   014632                        ENDMSG
  (3)  014632                                                  L10002:
  (3)  014632  104423                                                    TRAP    C$MSG
4443
4444
4445
4446   014634                        BGNMSG  ERR2
  (3)  014634                                                  ERR2::
4447   014634                        PRINTB  #FMT1,#ADDRES,MPCSR
  (9)  014634  013746  002446                                            MOV     MPCSR,-(SP)
  (8)  014640  012746  035622                                            MOV     #ADDRES,-(SP)
  (7)  014644  012746  011454                                            MOV     #FMT1,-(SP)
  (6)  014650  012746  000003                                            MOV     #3,-(SP)
  (3)  014654  010600                                                    MOV     SP,R0
  (4)  014656  104414                                                    TRAP    C$PNTB
  (4)  014660  062706  000010                                            ADD     #10,SP
4448   014664                        PRINTB  #FMT2
  (7)  014664  012746  011464                                            MOV     #FMT2,-(SP)
  (6)  014670  012746  000001                                            MOV     #1,-(SP)
  (3)  014674  010600                                                    MOV     SP,R0
  (4)  014676  104414                                                    TRAP    C$PNTB
  (4)  014700  062706  000004                                            ADD     #4,SP
4449   014704                        PRINTB  #FMT7,#DH1,REGNUM
  (9)  014704  013746  002400                                            MOV     REGNUM,-(SP)
  (8)  014710  012746  014266                                            MOV     #DH1,-(SP)
  (7)  014714  012746  011646                                            MOV     #FMT7,-(SP)
  (6)  014720  012746  000003                                            MOV     #3,-(SP)
  (3)  014724  010600                                                    MOV     SP,R0
  (4)  014726  104414                                                    TRAP    C$PNTB
  (4)  014730  062706  000010                                            ADD     #10,SP
4450   014734                        PRINTB  #FMT3,GOODAT,BADDAT
  (9)  014734  013746  002406                                            MOV     BADDAT,-(SP)
  (8)  014740  013746  002404                                            MOV     GOODAT,-(SP)
  (7)  014744  012746  011506                                            MOV     #FMT3,-(SP)
  (6)  014750  012746  000003                                            MOV     #3,-(SP)
  (3)  014754  010600                                                    MOV     SP,R0
  (4)  014756  104414                                                    TRAP    C$PNTB
  (4)  014760  062706  000010                                            ADD     #10,SP
4451   014764                        PRINTX  #FMT4,#DH2,#DH3
  (9)  014764  012746  014337                                            MOV     #DH3,-(SP)
  (8)  014770  012746  014310                                            MOV     #DH2,-(SP)
  (7)  014774  012746  011550                                            MOV     #FMT4,-(SP)
  (6)  015000  012746  000003                                            MOV     #3,-(SP)
  (3)  015004  010600                                                    MOV     SP,R0
  (4)  015006  104415                                                    TRAP    C$PNTX
  (4)  015010  062706  000010                                            ADD     #10,SP
4452   015014                        PRINTX  #FMT5,LUR10,LUR11,LUR12,LUR13
  (11) 015014  013746  002310                                            MOV     LUR13,-(SP)
  (10) 015020  013746  002306                                            MOV     LUR12,-(SP)
  (9)  015024  013746  002304                                            MOV     LUR11,-(SP)
  (8)  015030  013746  002302                                            MOV     LUR10,-(SP)
  (7)  015034  012746  011563                                            MOV     #FMT5,-(SP)
  (6)  015040  012746  000005                                            MOV     #5,-(SP)
```

```
  (3)  015044  010600                                                    MOV     SP,R0
  (4)  015046  104415                                                    TRAP    C$PNTX
  (4)  015050  062706  000014                                            ADD     #14,SP
4453   015054                        PRINTX  #FMT9,#DH4
  (8)  015054  012746  014375                                            MOV     #DH4,-(SP)
  (7)  015060  012746  011712                                            MOV     #FMT9,-(SP)
  (6)  015064  012746  000002                                            MOV     #2,-(SP)
  (3)  015070  010600                                                    MOV     SP,R0
  (4)  015072  104415                                                    TRAP    C$PNTX
  (4)  015074  062706  000006                                            ADD     #6,SP
4454   015100                        PRINTX  #FMT6,LUR14,LUR15,LUR16,LUR17
 (11)  015100  013746  002320                                            MOV     LUR17,-(SP)
 (10)  015104  013746  002316                                            MOV     LUR16,-(SP)
  (9)  015110  013746  002314                                            MOV     LUR15,-(SP)
  (8)  015114  013746  002312                                            MOV     LUR14,-(SP)
  (7)  015120  012746  011613                                            MOV     #FMT6,-(SP)
  (6)  015124  012746  000005                                            MOV     #5,-(SP)
  (3)  015130  010600                                                    MOV     SP,R0
  (4)  015132  104415                                                    TRAP    C$PNTX
  (4)  015134  062706  000014                                            ADD     #14,SP
4455   015140                        ENDMSG
  (3)  015140                                                  L10003:
  (3)  015140  104423                                                    TRAP    C$MSG
4456
4457
4458
4459
4460
4461   015142                        BGNMSG  ERR3
  (3)  015142                                                  ERR3::
4462   015142                        PRINTB  #FMT1,#ADDRES,MPCSR
  (9)  015142  013746  002446                                            MOV     MPCSR,-(SP)
  (8)  015146  012746  035622                                            MOV     #ADDRES,-(SP)
  (7)  015152  012746  011454                                            MOV     #FMT1,-(SP)
  (6)  015156  012746  000003                                            MOV     #3,-(SP)
  (3)  015162  010600                                                    MOV     SP,R0
  (4)  015164  104414                                                    TRAP    C$PNTB
  (4)  015166  062706  000010                                            ADD     #10,SP
4463   015172                        PRINTB  #FMT2
  (7)  015172  012746  011464                                            MOV     #FMT2,-(SP)
  (6)  015176  012746  000001                                            MOV     #1,-(SP)
  (3)  015202  010600                                                    MOV     SP,R0
  (4)  015204  104414                                                    TRAP    C$PNTB
  (4)  015206  062706  000004                                            ADD     #4,SP
4464   015212                        PRINTB  #FMT8,TMP1,TMP0
  (9)  015212  013746  002530                                            MOV     TMP0,-(SP)
  (8)  015216  013746  002532                                            MOV     TMP1,-(SP)
  (7)  015222  012746  011656                                            MOV     #FMT8,-(SP)
  (6)  015226  012746  000003                                            MOV     #3,-(SP)
  (3)  015232  010600                                                    MOV     SP,R0
  (4)  015234  104414                                                    TRAP    C$PNTB
  (4)  015236  062706  000010                                            ADD     #10,SP
4465   015242                        PRINTB  #FMT3,GOODAT,BADDAT
  (9)  015242  013746  002406                                            MOV     BADDAT,-(SP)
  (8)  015246  013746  002404                                            MOV     GOODAT,-(SP)
  (7)  015252  012746  011506                                            MOV     #FMT3,-(SP)
```

```
  (6)  015256  012746  000003                                    MOV     #3,-(SP)
  (3)  015262  010600                                            MOV     SP,R0
  (4)  015264  104414                                            TRAP    C$PNTB
  (4)  015266  062706  000010                                    ADD     #10,SP
4466   015272                    PRINTX  #FMT4,#DH2,#DH3
  (9)  015272  012746  014337                                    MOV     #DH3,-(SP)
  (8)  015276  012746  014310                                    MOV     #DH2,-(SP)
  (7)  015302  012746  011550                                    MOV     #FMT4,-(SP)
  (6)  015306  012746  000003                                    MOV     #3,-(SP)
  (3)  015312  010600                                            MOV     SP,R0
  (4)  015314  104415                                            TRAP    C$PNTX
  (4)  015316  062706  000010                                    ADD     #10,SP
4467   015322                    PRINTX  #FMT5,LUR10,LUR11,LUR12,LUR13
  (11) 015322  013746  002310                                    MOV     LUR13,-(SP)
  (10) 015326  013746  002306                                    MOV     LUR12,-(SP)
  (9)  015332  013746  002304                                    MOV     LUR11,-(SP)
  (8)  015336  013746  002302                                    MOV     LUR10,-(SP)
  (7)  015342  012746  011563                                    MOV     #FMT5,-(SP)
  (6)  015346  012746  000005                                    MOV     #5,-(SP)
  (3)  015352  010600                                            MOV     SP,R0
  (4)  015354  104415                                            TRAP    C$PNTX
  (4)  015356  062706  000014                                    ADD     #14,SP
4468   015362                    PRINTX  #FMT9,#DH4
  (8)  015362  012746  014375                                    MOV     #DH4,-(SP)
  (7)  015366  012746  011712                                    MOV     #FMT9,-(SP)
  (6)  015372  012746  000002                                    MOV     #2,-(SP)
  (3)  015376  010600                                            MOV     SP,R0
  (4)  015400  104415                                            TRAP    C$PNTX
  (4)  015402  062706  000006                                    ADD     #6,SP
4469   015406                    PRINTX  #FMT6,LUR14,LUR15,LUR16,LUR17
  (11) 015406  013746  002320                                    MOV     LUR17,-(SP)
  (10) 015412  013746  002316                                    MOV     LUR16,-(SP)
  (9)  015416  013746  002314                                    MOV     LUR15,-(SP)
  (8)  015422  013746  002312                                    MOV     LUR14,-(SP)
  (7)  015426  012746  011613                                    MOV     #FMT6,-(SP)
  (6)  015432  012746  000005                                    MOV     #5,-(SP)
  (3)  015436  010600                                            MOV     SP,R0
  (4)  015440  104415                                            TRAP    C$PNTX
  (4)  015442  062706  000014                                    ADD     #14,SP
4470   015446                    PRINTX  #FMT4,#DH7,#DH8
  (9)  015446  012746  014477                                    MOV     #DH8,-(SP)
  (8)  015452  012746  014445                                    MOV     #DH7,-(SP)
  (7)  015456  012746  011550                                    MOV     #FMT4,-(SP)
  (6)  015462  012746  000003                                    MOV     #3,-(SP)
  (3)  015466  010600                                            MOV     SP,R0
  (4)  015470  104415                                            TRAP    C$PNTX
  (4)  015472  062706  000010                                    ADD     #10,SP
4471   015476                    PRINTX  #FMT5,AX0.15,AX0.16,AX1.15,AX1.16
  (11) 015476  013746  002330                                    MOV     AX1.16,-(SP)
  (10) 015502  013746  002326                                    MOV     AX1.15,-(SP)
  (9)  015506  013746  002324                                    MOV     AX0.16,-(SP)
  (8)  015512  013746  002322                                    MOV     AX0.15,-(SP)
  (7)  015516  012746  011563                                    MOV     #FMT5,-(SP)
  (6)  015522  012746  000005                                    MOV     #5,-(SP)
  (3)  015526  010600                                            MOV     SP,R0
  (4)  015530  104415                                            TRAP    C$PNTX
```

```
  (4)  015532  062706  000014                                                    ADD     #14,SP
4472   015536
                        PRINTX  #FMT9,#DH9
  (8)  015536  012746  014536                                                    MOV     #DH9,-(SP)
  (7)  015542  012746  011712                                                    MOV     #FMT9,-(SP)
  (6)  015546  012746  000002                                                    MOV     #2,-(SP)
  (3)  015552  010600                                                            MOV     SP,R0
  (4)  015554  104415                                                            TRAP    C$PNTX
  (4)  015556  062706  000006                                                    ADD     #6,SP
4473   015562
                        PRINTX  #FMT6,AX2.15,AX2.16,AX3.15,AX3.16
  (11) 015562  013746  002340                                                    MOV     AX3.16,-(SP)
  (10) 015566  013746  002336                                                    MOV     AX3.15,-(SP)
  (9)  015572  013746  002334                                                    MOV     AX2.16,-(SP)
  (8)  015576  013746  002332                                                    MOV     AX2.15,-(SP)
  (7)  015602  012746  011613                                                    MOV     #FMT6,-(SP)
  (6)  015606  012746  000005                                                    MOV     #5,-(SP)
  (3)  015612  010600                                                            MOV     SP,R0
  (4)  015614  104415                                                            TRAP    C$PNTX
  (4)  015616  062706  000014                                                    ADD     #14,SP
4474   015622
                        ENDMSG
  (3)  015622                                                           L10004:
  (3)  015622  104423                                                            TRAP    C$MSG
4475
4476
4477
4478
4479
4480   015624
                        BGNMSG  ERR4
  (3)  015624                                                           ERR4::
4481   015624
                        PRINTB  #FMT10,SUBRPC
  (8)  015624  013746  002352                                                    MOV     SUBRPC,-(SP)
  (7)  015630  012746  011717                                                    MOV     #FMT10,-(SP)
  (6)  015634  012746  000002                                                    MOV     #2,-(SP)
  (3)  015640  010600                                                            MOV     SP,R0
  (4)  015642  104414                                                            TRAP    C$PNTB
  (4)  015644  062706  000006                                                    ADD     #6,SP
4482   015650
                        PRINTB  #FMT1,#ADDRES,MPCSR
  (9)  015650  013746  002446                                                    MOV     MPCSR,-(SP)
  (8)  015654  012746  035622                                                    MOV     #ADDRES,-(SP)
  (7)  015660  012746  011454                                                    MOV     #FMT1,-(SP)
  (6)  015664  012746  000003                                                    MOV     #3,-(SP)
  (3)  015670  010600                                                            MOV     SP,R0
  (4)  015672  104414                                                            TRAP    C$PNTB
  (4)  015674  062706  000010                                                    ADD     #10,SP
4483   015700
                        PRINTB  #FMT2
  (7)  015700  012746  011464                                                    MOV     #FMT2,-(SP)
  (6)  015704  012746  000001                                                    MOV     #1,-(SP)
  (3)  015710  010600                                                            MOV     SP,R0
  (4)  015712  104414                                                            TRAP    C$PNTB
  (4)  015714  062706  000004                                                    ADD     #4,SP
4484   015720
                        PRINTB  #FMT7,#DH1,REGNUM
  (9)  015720  013746  002400                                                    MOV     REGNUM,-(SP)
  (8)  015724  012746  014266                                                    MOV     #DH1,-(SP)
  (7)  015730  012746  011646                                                    MOV     #FMT7,-(SP)
  (6)  015734  012746  000003                                                    MOV     #3,-(SP)
  (3)  015740  010600                                                            MOV     SP,R0
  (4)  015742  104414                                                            TRAP    C$PNTB
```

```
  (4)  015744  062706  000010                                    ADD     #10,SP
4485   015750
                                PRINTX  #FMT4,#DH2,#DH3
  (9)  015750  012746  014337                                    MOV     #DH3,-(SP)
  (8)  015754  012746  014310                                    MOV     #DH2,-(SP)
  (7)  015760  012746  011550                                    MOV     #FMT4,-(SP)
  (6)  015764  012746  000003                                    MOV     #3,-(SP)
  (3)  015770  010600                                            MOV     SP,R0
  (4)  015772  104415                                            TRAP    C$PNTX
  (4)  015774  062706  000010                                    ADD     #10,SP
4486   016000
                                PRINTX  #FMT5,LUR10,LUR11,LUR12,LUR13
 (11)  016000  013746  002310                                    MOV     LUR13,-(SP)
 (10)  016004  013746  002306                                    MOV     LUR12,-(SP)
  (9)  016010  013746  002304                                    MOV     LUR11,-(SP)
  (8)  016014  013746  002302                                    MOV     LUR10,-(SP)
  (7)  016020  012746  011563                                    MOV     #FMT5,-(SP)
  (6)  016024  012746  000005                                    MOV     #5,-(SP)
  (3)  016030  010600                                            MOV     SP,R0
  (4)  016032  104415                                            TRAP    C$PNTX
  (4)  016034  062706  000014                                    ADD     #14,SP
4487   016040
                                PRINTX  #FMT9,#DH4
  (8)  016040  012746  014375                                    MOV     #DH4,-(SP)
  (7)  016044  012746  011712                                    MOV     #FMT9,-(SP)
  (6)  016050  012746  000002                                    MOV     #2,-(SP)
  (3)  016054  010600                                            MOV     SP,R0
  (4)  016056  104415                                            TRAP    C$PNTX
  (4)  015060  062706  000006                                    ADD     #6,SP
4488   016064
                                PRINTX  #FMT6,LUR14,LUR15,LUR16,LUR17
 (11)  016064  013746  002320                                    MOV     LUR17,-(SP)
 (10)  016070  013746  002316                                    MOV     LUR16,-(SP)
  (9)  016074  013746  002314                                    MOV     LUR15,-(SP)
  (8)  016100  013746  002312                                    MOV     LUR14,-(SP)
  (7)  016104  012746  011613                                    MOV     #FMT6,-(SP)
  (6)  016110  012746  000005                                    MOV     #5,-(SP)
  (3)  016114  010600                                            MOV     SP,R0
  (4)  016116  104415                                            TRAP    C$PNTX
  (4)  016120  062706  000014                                    ADD     #14,SP
4489   016124
                                PRINTX  #FMT4,#DH7,#DH8
  (9)  016124  012746  014477                                    MOV     #DH8,-(SP)
  (8)  016130  012746  014445                                    MOV     #DH7,-(SP)
  (7)  016134  012746  011550                                    MOV     #FMT4,-(SP)
  (6)  016140  012746  000003                                    MOV     #3,-(SP)
  (3)  016144  010600                                            MOV     SP,R0
  (4)  016146  104415                                            TRAP    C$PNTX
  (4)  016150  062706  000010                                    ADD     #10,SP
4490   016154
                                PRINTX  #FMT5,AX0.15,AX0.16,AX1.15,AX1.16
 (11)  016154  013746  002330                                    MOV     AX1.16,-(SP)
 (10)  016160  013746  002326                                    MOV     AX1.15,-(SP)
  (9)  016164  013746  002324                                    MOV     AX0.16,-(SP)
  (8)  016170  013746  002322                                    MOV     AX0.15,-(SP)
  (7)  016174  012746  011563                                    MOV     #FMT5,-(SP)
  (6)  016200  012746  000005                                    MOV     #5,-(SP)
  (3)  016204  010600                                            MOV     SP,R0
  (4)  016206  104415                                            TRAP    C$PNTX
  (4)  016210  062706  000014                                    ADD     #14,SP
4491   016214
                                PRINTX  #FMT9,#DH9
  (8)  016214  012746  014536                                    MOV     #DH9,-(SP)
```

```
  (7)  016220  012746  011712                                                  MOV     #FMT9,-(SP)
  (6)  016224  012746  000002                                                  MOV     #2,-(SP)
  (3)  016230  010600                                                          MOV     SP,R0
  (4)  016232  104415                                                          TRAP    C$PNTX
  (4)  016234  062706  000006                                                  ADD     #6,SP
4492   016240                        PRINTX  #FMT6,AX2.15,AX2.16,AX3.15,AX3.16
 (11)  016240  013746  002340                                                  MOV     AX3.16,-(SP)
 (10)  016244  013746  002336                                                  MOV     AX3.15,-(SP)
  (9)  016250  013746  002334                                                  MOV     AX2.16,-(SP)
  (8)  016254  013746  002332                                                  MOV     AX2.15,-(SP)
  (7)  016260  012746  011613                                                  MOV     #FMT6,-(SP)
  (6)  016264  012746  000005                                                  MOV     #5,-(SP)
  (3)  016270  010600                                                          MOV     SP,R0
  (4)  016272  104415                                                          TRAP    C$PNTX
  (4)  016274  062706  000014                                                  ADD     #14,SP
4493   016300                        ENDMSG
  (3)  016300                                                        L10005:
  (3)  016300  104423                                                          TRAP    C$MSG
4494
4495
4496
4497
4498
4499   016302                        BGNMSG  ERR5
  (3)  016302                                                        ERR5::
4500   016302                        PRINTB  #FMT1,#ADDRES,MPCSR
  (9)  016302  013746  002446                                                  MOV     MPCSR,-(SP)
  (8)  016306  012746  035622                                                  MOV     #ADDRES,-(SP)
  (7)  016312  012746  011454                                                  MOV     #FMT1,-(SP)
  (6)  016316  012746  000003                                                  MOV     #3,-(SP)
  (3)  016322  010600                                                          MOV     SP,R0
  (4)  016324  104414                                                          TRAP    C$PNTB
  (4)  016326  062706  000010                                                  ADD     #10,SP
4501   016332                        PRINTB  #FMT11,REGNUM,LOADAT
  (9)  016332  013746  002410                                                  MOV     LOADAT,-(SP)
  (8)  016336  013746  002400                                                  MOV     REGNUM,-(SP)
  (7)  016342  012746  011750                                                  MOV     #FMT11,-(SP)
  (6)  016346  012746  000003                                                  MOV     #3,-(SP)
  (3)  016352  010600                                                          MOV     SP,R0
  (4)  016354  104414                                                          TRAP    C$PNTB
  (4)  016356  062706  000010                                                  ADD     #10,SP
4502   016362                        PRINTB  #FMT2
  (7)  016362  012746  011464                                                  MOV     #FMT2,-(SP)
  (6)  016366  012746  000001                                                  MOV     #1,-(SP)
  (3)  016372  010600                                                          MOV     SP,R0
  (4)  016374  104414                                                          TRAP    C$PNTB
  (4)  016376  062706  000004                                                  ADD     #4,SP
4503   016402                        PRINTB  #FMT8,TMP1,TMP0
  (9)  016402  013746  002530                                                  MOV     TMP0,-(SP)
  (8)  016406  013746  002532                                                  MOV     TMP1,-(SP)
  (7)  016412  012746  011656                                                  MOV     #FMT8,-(SP)
  (6)  016416  012746  000003                                                  MOV     #3,-(SP)
  (3)  016422  010600                                                          MOV     SP,R0
  (4)  016424  104414                                                          TRAP    C$PNTB
  (4)  016426  062706  000010                                                  ADD     #10,SP
4504   016432                        PRINTB  #FMT3,GOODAT,BADDAT
```

```
    (9)  016432  013746  002406                                    MOV     BADDAT,-(SP)
    (8)  016436  013746  002404                                    MOV     GOODAT,-(SP)
    (7)  016442  012746  011506                                    MOV     #FMT3,-(SP)
    (6)  016446  012746  000003                                    MOV     #3,-(SP)
    (3)  016452  010600                                            MOV     SP,R0
    (4)  016454  104414                                            TRAP    C$PNTB
    (4)  016456  062706  000010                                    ADD     #10,SP
4505     016462                  PRINTX  #FMT4,#DH2,#DH3
    (9)  016462  012746  014337                                    MOV     #DH3,-(SP)
    (8)  016466  012746  014310                                    MOV     #DH2,-(SP)
    (7)  016472  012746  011550                                    MOV     #FMT4,-(SP)
    (6)  016476  012746  000003                                    MOV     #3,-(SP)
    (3)  016502  010600                                            MOV     SP,R0
    (4)  016504  104415                                            TRAP    C$PNTX
    (4)  016506  062706  000010                                    ADD     #10,SP
4506     016512                  PRINTX  #FMT5,LUR10,LUR11,LUR12,LUR13
   (11)  016512  013746  002310                                    MOV     LUR13,-(SP)
   (10)  016516  013746  002306                                    MOV     LUR12,-(SP)
    (9)  016522  013746  002304                                    MOV     LUR11,-(SP)
    (8)  016526  013746  002302                                    MOV     LUR10,-(SP)
    (7)  016532  012746  011563                                    MOV     #FMT5,-(SP)
    (6)  016536  012746  000005                                    MOV     #5,-(SP)
    (3)  016542  010600                                            MOV     SP,R0
    (4)  016544  104415                                            TRAP    C$PNTX
    (4)  016546  062706  000014                                    ADD     #14,SP
4507     016552                  PRINTX  #FMT9,#DH4
    (8)  016552  012746  014375                                    MOV     #DH4,-(SP)
    (7)  016556  012746  011712                                    MOV     #FMT9,-(SP)
    (6)  016562  012746  000002                                    MOV     #2,-(SP)
    (3)  016566  010600                                            MOV     SP,R0
    (4)  016570  104415                                            TRAP    C$PNTX
    (4)  016572  062706  000006                                    ADD     #6,SP
4508     016576                  PRINTX  #FMT6,LUR14,LUR15,LUR16,LUR17
   (11)  016576  013746  002320                                    MOV     LUR17,-(SP)
   (10)  016602  013746  002316                                    MOV     LUR16,-(SP)
    (9)  016606  013746  002314                                    MOV     LUR15,-(SP)
    (8)  016612  013746  002312                                    MOV     LUR14,-(SP)
    (7)  016616  012746  011613                                    MOV     #FMT6,-(SP)
    (6)  016622  012746  000005                                    MOV     #5,-(SP)
    (3)  016626  010600                                            MOV     SP,R0
    (4)  016630  104415                                            TRAP    C$PNTX
    (4)  016632  062706  000014                                    ADD     #14,SP
4509     016636                  PRINTX  #FMT4,#DH7,#DH8
    (9)  016636  012746  014477                                    MOV     #DH8,-(SP)
    (8)  016642  012746  014445                                    MOV     #DH7,-(SP)
    (7)  016646  012746  011550                                    MOV     #FMT4,-(SP)
    (6)  016652  012746  000003                                    MOV     #3,-(SP)
    (3)  016656  010600                                            MOV     SP,R0
    (4)  016660  104415                                            TRAP    C$PNTX
    (4)  016662  062706  000010                                    ADD     #10,SP
4510     016666                  PRINTX  #FMT5,AX0.15,AX0.16,AX1.15,AX1.16
   (11)  016666  013746  002330                                    MOV     AX1.16,-(SP)
   (10)  016672  013746  002326                                    MOV     AX1.15,-(SP)
    (9)  016676  013746  002324                                    MOV     AX0.16,-(SP)
    (8)  016702  013746  002322                                    MOV     AX0.15,-(SP)
    (7)  016706  012746  011563                                    MOV     #FMT5,-(SP)
```

```
  (6)  016712  012746  000005                                                  MOV     #5,-(SP)
  (3)  016716  010600                                                          MOV     SP,R0
  (4)  016720  104415                                                          TRAP    C$PNTX
  (4)  016722  062706  000014                                                  ADD     #14,SP
4511   016726                        PRINTX  #FMT9,#DH9
  (8)  016726  012746  014536                                                  MOV     #DH9,-(SP)
  (7)  016732  012746  011712                                                  MOV     #FMT9,-(SP)
  (6)  016736  012746  000002                                                  MOV     #2,-(SP)
  (3)  016742  010600                                                          MOV     SP,R0
  (4)  016744  104415                                                          TRAP    C$PNTX
  (4)  016746  062706  000006                                                  ADD     #6,SP
4512   016752                        PRINTX  #FMT6,AX2.15,AX2.16,AX3.15,AX3.16
  (11) 016752  013746  002340                                                  MOV     AX3.16,-(SP)
  (10) 016756  013746  002336                                                  MOV     AX3.15,-(SP)
  (9)  016762  013746  002334                                                  MOV     AX2.16,-(SP)
  (8)  016766  013746  002332                                                  MOV     AX2.15,-(SP)
  (7)  016772  012746  011613                                                  MOV     #FMT6,-(SP)
  (6)  016776  012746  000005                                                  MOV     #5,-(SP)
  (3)  017002  010600                                                          MOV     SP,R0
  (4)  017004  104415                                                          TRAP    C$PNTX
  (4)  017006  062706  000014                                                  ADD     #14,SP
4513   017012                        ENDMSG
  (3)  017012                                                        L10006:
  (3)  017012  104423                                                          TRAP    C$MSG
4514
4515
4516
4517
4518
4519   017014                        BGNMSG  ERR6
  (3)  017014                                                        ERR6::
4520   017014                        PRINTB  #FMT10,SUBRPC
  (8)  017014  013746  002352                                                  MOV     SUBRPC,-(SP)
  (7)  017020  012746  011717                                                  MOV     #FMT10,-(SP)
  (6)  017024  012746  000002                                                  MOV     #2,-(SP)
  (3)  017030  010600                                                          MOV     SP,R0
  (4)  017032  104414                                                          TRAP    C$PNTB
  (4)  017034  062706  000006                                                  ADD     #6,SP
4521   017040                        PRINTB  #FMT1,#ADDRES,MPCSR
  (9)  017040  013746  002446                                                  MOV     MPCSR,-(SP)
  (8)  017044  012746  035622                                                  MOV     #ADDRES,-(SP)
  (7)  017050  012746  011454                                                  MOV     #FMT1,-(SP)
  (6)  017054  012746  000003                                                  MOV     #3,-(SP)
  (3)  017060  010600                                                          MOV     SP,R0
  (4)  017062  104414                                                          TRAP    C$PNTB
  (4)  017064  062706  000010                                                  ADD     #10,SP
4522   017070                        PRINTB  #FMT2
  (7)  017070  012746  011464                                                  MOV     #FMT2,-(SP)
  (6)  017074  012746  000001                                                  MOV     #1,-(SP)
  (3)  017100  010600                                                          MOV     SP,R0
  (4)  017102  104414                                                          TRAP    C$PNTB
  (4)  017104  062706  000004                                                  ADD     #4,SP
4523   017110                        PRINTB  #FMT8,TMP1,TMP0
  (9)  017110  013746  002530                                                  MOV     TMP0,-(SP)
  (8)  017114  013746  002532                                                  MOV     TMP1,-(SP)
  (7)  017120  012746  011656                                                  MOV     #FMT8,-(SP)
```

```
  (6)  017124  012746  000003                                  MOV     #3,-(SP)
  (3)  017130  010600                                          MOV     SP,R0
  (4)  017132  104414                                          TRAP    C$PNTB
  (4)  017134  062706  000010                                  ADD     #10,SP
4524   017140                  PRINTX  #FMT4,#DH2,#DH3
  (9)  017140  012746  014337                                  MOV     #DH3,-(SP)
  (8)  017144  012746  014310                                  MOV     #DH2,-(SP)
  (7)  017150  012746  011550                                  MOV     #FMT4,-(SP)
  (6)  017154  012746  000003                                  MOV     #3,-(SP)
  (3)  017160  010600                                          MOV     SP,R0
  (4)  017162  104415                                          TRAP    C$PNTX
  (4)  017164  062706  000010                                  ADD     #10,SP
4525   017170                  PRINTX  #FMT5,LUR10,LUR11,LUR12,LUR13
 (11)  017170  013746  002310                                  MOV     LUR13,-(SP)
 (10)  017174  013746  002306                                  MOV     LUR12,-(SP)
  (9)  017200  013746  002304                                  MOV     LUR11,-(SP)
  (8)  017204  013746  002302                                  MOV     LUR10,-(SP)
  (7)  017210  012746  011563                                  MOV     #FMT5,-(SP)
  (6)  017214  012746  000005                                  MOV     #5,-(SP)
  (3)  017220  010600                                          MOV     SP,R0
  (4)  017222  104415                                          TRAP    C$PNTX
  (4)  017224  062706  000014                                  ADD     #14,SP
4526   017230                  PRINTX  #FMT9,#DH4
  (8)  017230  012746  014375                                  MOV     #DH4,-(SP)
  (7)  017234  012746  011712                                  MOV     #FMT9,-(SP)
  (6)  017240  012746  000002                                  MOV     #2,-(SP)
  (3)  017244  010600                                          MOV     SP,R0
  (4)  017246  104415                                          TRAP    C$PNTX
  (4)  017250  062706  000006                                  ADD     #6,SP
4527   017254                  PRINTX  #FMT6,LUR14,LUR15,LUR16,LUR17
 (11)  017254  013746  002320                                  MOV     LUR17,-(SP)
 (10)  017260  013746  002316                                  MOV     LUR16,-(SP)
  (9)  017264  013746  002314                                  MOV     LUR15,-(SP)
  (8)  017270  013746  002312                                  MOV     LUR14,-(SP)
  (7)  017274  012746  011613                                  MOV     #FMT6,-(SP)
  (6)  017300  012746  000005                                  MOV     #5,-(SP)
  (3)  017304  010600                                          MOV     SP,R0
  (4)  017306  104415                                          TRAP    C$PNTX
  (4)  017310  062706  000014                                  ADD     #14,SP
4528   017314                  PRINTX  #FMT4,#DH7,#DH8
  (9)  017314  012746  014477                                  MOV     #DH8,-(SP)
  (8)  017320  012746  014445                                  MOV     #DH7,-(SP)
  (7)  017324  012746  011550                                  MOV     #FMT4,-(SP)
  (6)  017330  012746  000003                                  MOV     #3,-(SP)
  (3)  017334  010600                                          MOV     SP,R0
  (4)  017336  104415                                          TRAP    C$PNTX
  (4)  017340  062706  000010                                  ADD     #10,SP
4529   017344                  PRINTX  #FMT5,AX0.15,AX0.16,AX1.15,AX1.16
 (11)  017344  013746  002330                                  MOV     AX1.16,-(SP)
 (10)  017350  013746  002326                                  MOV     AX1.15,-(SP)
  (9)  017354  013746  002324                                  MOV     AX0.16,-(SP)
  (8)  017360  013746  002322                                  MOV     AX0.15,-(SP)
  (7)  017364  012746  011563                                  MOV     #FMT5,-(SP)
  (6)  017370  012746  000005                                  MOV     #5,-(SP)
  (3)  017374  010600                                          MOV     SP,R0
  (4)  017376  104415                                          TRAP    C$PNTX
```

```
  (4)  017400  062706  000014                                                    ADD     #14,SP
4530   017404
  (8)  017404  012746  014536  PRINTX  #FMT9,#DH9                               MOV     #DH9,-(SP)
  (7)  017410  012746  011712                                                    MOV     #FMT9,-(SP)
  (6)  017414  012746  000002                                                    MOV     #2,-(SP)
  (3)  017420  010600                                                            MOV     SP,R0
  (4)  017422  104415                                                            TRAP    C$PNTX
  (4)  017424  062706  000006                                                    ADD     #6,SP
4531   017430
 (11)  017430  013746  002340  PRINTX  #FMT6,AX2.15,AX2.16,AX3.15,AX3.16        MOV     AX3.16,-(SP)
 (10)  017434  013746  002336                                                    MOV     AX3.15,-(SP)
  (9)  017440  013746  002334                                                    MOV     AX2.16,-(SP)
  (8)  017444  013746  002332                                                    MOV     AX2.15,-(SP)
  (7)  017450  012746  011613                                                    MOV     #FMT6,-(SP)
  (6)  017454  012746  000005                                                    MOV     #5,-(SP)
  (3)  017460  010600                                                            MOV     SP,R0
  (4)  017462  104415                                                            TRAP    C$PNTX
  (4)  017464  062706  000014                                                    ADD     #14,SP
4532   017470
  (3)  017470  ENDMSG                                                   L10007:
  (3)  017470  104423                                                            TRAP    C$MSG
4533
4534
4535
4536
4537
4538   017472  BGNMSG  ERR7                                                    ERR7::
  (3)  017472
4539   017472  PRINTB  #FMT1,#ADDRES,MPCSR                                     MOV     MPCSR,-(SP)
  (9)  017472  013746  002446                                                    MOV     #ADDRES,-(SP)
  (8)  017476  012746  035622                                                    MOV     #FMT1,-(SP)
  (7)  017502  012746  011454                                                    MOV     #3,-(SP)
  (6)  017506  012746  000003                                                    MOV     SP,R0
  (3)  017512  010600                                                            TRAP    C$PNTB
  (4)  017514  104414                                                            ADD     #10,SP
  (4)  017516  062706  000010
4540   017522  PRINTB  #FMT2                                                    MOV     #FMT2,-(SP)
  (7)  017522  012746  011464                                                    MOV     #1,-(SP)
  (6)  017526  012746  000001                                                    MOV     SP,R0
  (3)  017532  010600                                                            TRAP    C$PNTB
  (4)  017534  104414                                                            ADD     #4,SP
  (4)  017536  062706  000004
4541   017542  PRINTB  #FMT7,#DH1,REGNUM                                        MOV     REGNUM,-(SP)
  (9)  017542  013746  002400                                                    MOV     #DH1,-(SP)
  (8)  017546  012746  014266                                                    MOV     #FMT7,-(SP)
  (7)  017552  012746  011646                                                    MOV     #3,-(SP)
  (6)  017556  012746  000003                                                    MOV     SP,R0
  (3)  017562  010600                                                            TRAP    C$PNTB
  (4)  017564  104414                                                            ADD     #10,SP
  (4)  017566  062706  000010
4542   017572  PRINTX  #FMT4,#DH2,#DH3                                         MOV     #DH3,-(SP)
  (9)  017572  012746  014337                                                    MOV     #DH2,-(SP)
  (8)  017576  012746  014310                                                    MOV     #FMT4,-(SP)
  (7)  017602  012746  011550                                                    MOV     #3,-(SP)
  (6)  017606  012746  000003                                                    MOV     SP,R0
  (3)  017612  010600
```

```
  (4)  017614  104415
  (4)  017616  062706  000010
4543   017622
 (11)  017622  013746  002310
 (10)  017626  013746  002306
  (9)  017632  013746  002304
  (8)  017636  013746  002302
  (7)  017642  012746  011563
  (6)  017646  012746  000005
  (3)  017652  010600
  (4)  017654  104415
  (4)  017656  062706  000014
4544   017662
  (8)  017662  012746  014375
  (7)  017666  012746  011712
  (6)  017672  012746  000002
  (3)  017676  010600
  (4)  017700  104415
  (4)  017702  062706  000006
4545   017706
 (11)  017706  013746  002320
 (10)  017712  013746  002316
  (9)  017716  013746  002314
  (8)  017722  013746  002312
  (7)  017726  012746  011613
  (6)  017732  012746  000005
  (3)  017736  010600
  (4)  017740  104415
  (4)  017742  062706  000014
4546   017746
  (9)  017746  012746  014477
  (8)  017752  012746  014445
  (7)  017756  012746  011550
  (6)  017762  012746  000003
  (3)  017766  010600
  (4)  017770  104415
  (4)  017772  062706  000010
4547   017776
 (11)  017776  013746  002330
 (10)  020002  013746  002326
  (9)  020006  013746  002324
  (8)  020012  013746  002322
  (7)  020016  012746  011563
  (6)  020022  012746  000005
  (3)  020026  010600
  (4)  020030  104415
  (4)  020032  062706  000014
4548   020036
  (8)  020036  012746  014536
  (7)  020042  012746  011712
  (6)  020046  012746  000002
  (3)  020052  010600
  (4)  020054  104415
  (4)  020056  062706  000006
4549   020062
 (11)  020062  013746  002340

        PRINTX  #FMT5,LUR10,LUR11,LUR12,LUR13

                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

        PRINTX  #FMT9,#DH4

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

        PRINTX  #FMT6,LUR14,LUR15,LUR16,LUR17

                MOV     LUR17,-(SP)
                MOV     LUR16,-(SP)
                MOV     LUR15,-(SP)
                MOV     LUR14,-(SP)
                MOV     #FMT6,-(SP)
                MOV     #5,-(SP)
                MOV     SP,R0
                TRAP    C$PNTX
                ADD     #14,SP

        PRINTX  #FMT4,#DH7,#DH8

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

        PRINTX  #FMT5,AX0.15,AX0.16,AX1.15,AX1.16

                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

        PRINTX  #FMT9,#DH9

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

        PRINTX  #FMT6,AX2.15,AX2.16,AX3.15,AX3.16

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

```
  (10) 020066  013746  002336                                                  MOV     AX3.15,-(SP)
  (9)  020072  013746  002334                                                  MOV     AX2.16,-(SP)
  (8)  020076  013746  002332                                                  MOV     AX2.15,-(SP)
  (7)  020102  012746  011613                                                  MOV     #FMT6,-(SP)
  (6)  020106  012746  000005                                                  MOV     #5,-(SP)
  (3)  020112  010600                                                          MOV     SP,R0
  (4)  020114  104415                                                          TRAP    C$PNTX
  (4)  020116  062706  000014                                                  ADD     #14,SP
4550   020122                        ENDMSG
  (3)  020122                                                          L10010:
  (3)  020122  104423                                                          TRAP    C$MSG
4551
4552
4553
4554
4555
4556   020124                        BGNMSG  ERR8
  (3)  020124                                                          ERR8::
4557   020124                        PRINTB  #FMT10,SUBRPC
  (8)  020124  013746  002352                                                  MOV     SUBRPC,-(SP)
  (7)  020130  012746  011717                                                  MOV     #FMT10,-(SP)
  (6)  020134  012746  000002                                                  MOV     #2,-(SP)
  (3)  020140  010600                                                          MOV     SP,R0
  (4)  020142  104414                                                          TRAP    C$PNTB
  (4)  020144  062706  000006                                                  ADD     #6,SP
4558   020150                        PRINTB  #FMT1,#ADDRES,MPCSR
  (9)  020150  013746  002446                                                  MOV     MPCSR,-(SP)
  (8)  020154  012746  035622                                                  MOV     #ADDRES,-(SP)
  (7)  020160  012746  011454                                                  MOV     #FMT1,-(SP)
  (6)  020164  012746  000003                                                  MOV     #3,-(SP)
  (3)  020170  010600                                                          MOV     SP,R0
  (4)  020172  104414                                                          TRAP    C$PNTB
  (4)  020174  062706  000010                                                  ADD     #10,SP
4559   020200                        PRINTB  #FMT2
  (7)  020200  012746  011464                                                  MOV     #FMT2,-(SP)
  (6)  020204  012746  000001                                                  MOV     #1,-(SP)
  (3)  020210  010600                                                          MOV     SP,R0
  (4)  020212  104414                                                          TRAP    C$PNTB
  (4)  020214  062706  000004                                                  ADD     #4,SP
4560   020220                        PRINTB  #FMT7,#DH1,REGNUM
  (9)  020220  013746  002400                                                  MOV     REGNUM,-(SP)
  (8)  020224  012746  014266                                                  MOV     #DH1,-(SP)
  (7)  020230  012746  011646                                                  MOV     #FMT7,-(SP)
  (6)  020234  012746  000003                                                  MOV     #3,-(SP)
  (3)  020240  010600                                                          MOV     SP,R0
  (4)  020242  104414                                                          TRAP    C$PNTB
  (4)  020244  062706  000010                                                  ADD     #10,SP
4561   020250                        PRINTB  #FMT3,GOODAT,BADDAT
  (9)  020250  013746  002406                                                  MOV     BADDAT,-(SP)
  (8)  020254  013746  002404                                                  MOV     GOODAT,-(SP)
  (7)  020260  012746  011506                                                  MOV     #FMT3,-(SP)
  (6)  020264  012746  000003                                                  MOV     #3,-(SP)
  (3)  020270  010600                                                          MOV     SP,R0
  (4)  020272  104414                                                          TRAP    C$PNTB
  (4)  020274  062706  000010                                                  ADD     #10,SP
4562   020300                        PRINTX  #FMT4,#DH2,#DH3
```

```
  (9)  020300  012746  014337                                    MOV     #DH3,-(SP)
  (8)  020304  012746  014310                                    MOV     #DH2,-(SP)
  (7)  020310  012746  011550                                    MOV     #FMT4,-(SP)
  (6)  020314  012746  000003                                    MOV     #3,-(SP)
  (3)  020320  010600                                            MOV     SP,R0
  (4)  020322  104415                                            TRAP    C$PNTX
  (4)  020324  062706  000010                                    ADD     #10,SP
4563   020330                  PRINTX  #FMT5,LUR10,LUR11,LUR12,LUR13
  (11) 020330  013746  002310                                    MOV     LUR13,-(SP)
  (10) 020334  013746  002306                                    MOV     LUR12,-(SP)
  (9)  020340  013746  002304                                    MOV     LUR11,-(SP)
  (8)  020344  013746  002302                                    MOV     LUR10,-(SP)
  (7)  020350  012746  011563                                    MOV     #FMT5,-(SP)
  (6)  020354  012746  000005                                    MOV     #5,-(SP)
  (3)  020360  010600                                            MOV     SP,R0
  (4)  020362  104415                                            TRAP    C$PNTX
  (4)  020364  062706  000014                                    ADD     #14,SP
4564   020370                  PRINTX  #FMT9,#DH4
  (8)  020370  012746  014375                                    MOV     #DH4,-(SP)
  (7)  020374  012746  011712                                    MOV     #FMT9,-(SP)
  (6)  020400  012746  000002                                    MOV     #2,-(SP)
  (3)  020404  010600                                            MOV     SP,R0
  (4)  020406  104415                                            TRAP    C$PNTX
  (4)  020410  062706  000006                                    ADD     #6,SP
4565   020414                  PRINTX  #FMT6,LUR14,LUR15,LUR16,LUR17
  (11) 020414  013746  002320                                    MOV     LUR17,-(SP)
  (10) 020420  013746  002316                                    MOV     LUR16,-(SP)
  (9)  020424  013746  002314                                    MOV     LUR15,-(SP)
  (8)  020430  013746  002312                                    MOV     LUR14,-(SP)
  (7)  020434  012746  011613                                    MOV     #FMT6,-(SP)
  (6)  020440  012746  000005                                    MOV     #5,-(SP)
  (3)  020444  010600                                            MOV     SP,R0
  (4)  020446  104415                                            TRAP    C$PNTX
  (4)  020450  062706  000014                                    ADD     #14,SP
4566   020454                  PRINTX  #FMT4,#DH7,#DH8
  (9)  020454  012746  014477                                    MOV     #DH8,-(SP)
  (8)  020460  012746  014445                                    MOV     #DH7,-(SP)
  (7)  020464  012746  011550                                    MOV     #FMT4,-(SP)
  (6)  020470  012746  000003                                    MOV     #3,-(SP)
  (3)  020474  010600                                            MOV     SP,R0
  (4)  020476  104415                                            TRAP    C$PNTX
  (4)  020500  062706  000010                                    ADD     #10,SP
4567   020504                  PRINTX  #FMT5,AX0.15,AX0.16,AX1.15,AX1.16
  (11) 020504  013746  002330                                    MOV     AX1.16,-(SP)
  (10) 020510  013746  002326                                    MOV     AX1.15,-(SP)
  (9)  020514  013746  002324                                    MOV     AX0.16,-(SP)
  (8)  020520  013746  002322                                    MOV     AX0.15,-(SP)
  (7)  020524  012746  011563                                    MOV     #FMT5,-(SP)
  (6)  020530  012746  000005                                    MOV     #5,-(SP)
  (3)  020534  010600                                            MOV     SP,R0
  (4)  020536  104415                                            TRAP    C$PNTX
  (4)  020540  062706  000014                                    ADD     #14,SP
4568   020544                  PRINTX  #FMT9,#DH9
  (8)  020544  012746  014536                                    MOV     #DH9,-(SP)
  (7)  020550  012746  011712                                    MOV     #FMT9,-(SP)
  (6)  020554  012746  000002                                    MOV     #2,-(SP)
```

```
  (3)  020560  010600                                                                    MOV     SP,R0
  (4)  020562  104415                                                                    TRAP    C$PNTX
  (4)  020564  062706  000006                                                           ADD     #6,SP
4569   020570                        PRINTX  #FMT6,AX2.15,AX2.16,AX3.15,AX3.16
 (11)  020570  013746  002340                                                           MOV     AX3.16,-(SP)
 (10)  020574  013746  002336                                                           MOV     AX3.15,-(SP)
  (9)  020600  013746  002334                                                           MOV     AX2.16,-(SP)
  (8)  020604  013746  002332                                                           MOV     AX2.15,-(SP)
  (7)  020610  012746  011613                                                           MOV     #FMT6,-(SP)
  (6)  020614  012746  000005                                                           MOV     #5,-(SP)
  (3)  020620  010600                                                                   MOV     SP,R0
  (4)  020622  104415                                                                   TRAP    C$PNTX
  (4)  020624  062706  000014                                                           ADD     #14,SP
4570   020630                        ENDMSG
  (3)  020630                                                                 L10011:
  (3)  020630  104423                                                                   TRAP    C$MSG
4571
4572
4573
4574
4575
4576   020632                        BGNMSG  ERR9
  (3)  020632                                                                 ERR9::
4577   020632                        PRINTB  #FMT1,#ADDRES,MPCSR
  (9)  020632  013746  002446                                                           MOV     MPCSR,-(SP)
  (8)  020636  012746  035622                                                           MOV     #ADDRES,-(SP)
  (7)  020642  012746  011454                                                           MOV     #FMT1,-(SP)
  (6)  020646  012746  000003                                                           MOV     #3,-(SP)
  (3)  020652  010600                                                                   MOV     SP,R0
  (4)  020654  104414                                                                   TRAP    C$PNTB
  (4)  020656  062706  000010                                                           ADD     #10,SP
4578   020662                        PRINTB  #FMT2
  (7)  020662  012746  011464                                                           MOV     #FMT2,-(SP)
  (6)  020666  012746  000001                                                           MOV     #1,-(SP)
  (3)  020672  010600                                                                   MOV     SP,R0
  (4)  020674  104414                                                                   TRAP    C$PNTB
  (4)  020676  062706  000004                                                           ADD     #4,SP
4579   020702                        PRINTB  #FMT7,#DH1,REGNUM
  (9)  020702  013746  002400                                                           MOV     REGNUM,-(SP)
  (8)  020706  012746  014266                                                           MOV     #DH1,-(SP)
  (7)  020712  012746  011646                                                           MOV     #FMT7,-(SP)
  (6)  020716  012746  000003                                                           MOV     #3,-(SP)
  (3)  020722  010600                                                                   MOV     SP,R0
  (4)  020724  104414                                                                   TRAP    C$PNTB
  (4)  020726  062706  000010                                                           ADD     #10,SP
4580   020732                        PRINTX  #FMT4,#DH2,#DH3
  (9)  020732  012746  014337                                                           MOV     #DH3,-(SP)
  (8)  020736  012746  014310                                                           MOV     #DH2,-(SP)
  (7)  020742  012746  011550                                                           MOV     #FMT4,-(SP)
  (6)  020746  012746  000003                                                           MOV     #3,-(SP)
  (3)  020752  010600                                                                   MOV     SP,R0
  (4)  020754  104415                                                                   TRAP    C$PNTX
  (4)  020756  062706  000010                                                           ADD     #10,SP
4581   020762                        PRINTX  #FMT5,LUR10,LUR11,LUR12,LUR13
 (11)  020762  013746  002310                                                           MOV     LUR13,-(SP)
 (10)  020766  013746  002306                                                           MOV     LUR12,-(SP)
```

```
  (9)  020772  013746  002304                                    MOV     LUR11,-(SP)
  (8)  020776  013746  002302                                    MOV     LUR10,-(SP)
  (7)  021002  012746  011563                                    MOV     #FMT5,-(SP)
  (6)  021006  012746  000005                                    MOV     #5,-(SP)
  (3)  021012  010600                                            MOV     SP,R0
  (4)  021014  104415                                            TRAP    C$PNTX
  (4)  021016  062706  000014                                    ADD     #14,SP
4582   021022
                                PRINTX  #FMT9,#DH4
  (8)  021022  012746  014375                                    MOV     #DH4,-(SP)
  (7)  021026  012746  011712                                    MOV     #FMT9,-(SP)
  (6)  021032  012746  000002                                    MOV     #2,-(SP)
  (3)  021036  010600                                            MOV     SP,R0
  (4)  021040  104415                                            TRAP    C$PNTX
  (4)  021042  062706  000006                                    ADD     #6,SP
4583   021046
                                PRINTX  #FMT6,LUR14,LUR15,LUR16,LUR17
  (11) 021046  013746  002320                                    MOV     LUR17,-(SP)
  (10) 021052  013746  002316                                    MOV     LUR16,-(SP)
  (9)  021056  013746  002314                                    MOV     LUR15,-(SP)
  (8)  021062  013746  002312                                    MOV     LUR14,-(SP)
  (7)  021066  012746  011613                                    MOV     #FMT6,-(SP)
  (6)  021072  012746  000005                                    MOV     #5,-(SP)
  (3)  021076  010600                                            MOV     SP,R0
  (4)  021100  104415                                            TRAP    C$PNTX
  (4)  021102  062706  000014                                    ADD     #14,SP
4584   021106
                                ENDMSG
  (3)  021106                                            L10012:
  (3)  021106  104423                                            TRAP    C$MSG
4585
4586
4587
4588
4589
```

```
 4591                           .SBTTL  REPORT CODING SECTION
 4592
 4593
 4594                           ;////////////////////////////////////////////////////////////////////////////////
 4595                           ;/ THE REPORT CODING SECTION CONTAINS THE
 4596                           ;/ 'PRINTS" CALLS THAT GENERATE STATISTICAL REPORTS.
 4597                           ;////////////////////////////////////////////////////////////////////////////////
 4598
 4599  021110                           BGNRPT
  (3)  021110                                                                  L$RPT::
 4600
 4601  021110                           ENDRPT
  (3)  021110                                                                  L10013:
  (3)  021110  104425                                                                  TRAP    C$RPT
 4602
 4603
 4604
 4605
 4606
```

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

021120                          BGNINIT
(3) 021120                                                              L$INIT::

021120  010637  002346          MOV     SP,PSTACK       ;SAVE BASE-LEVEL STACK POINTER
021124  005037  002352          CLR     SUBRPC          ;CLEAR SUBR CALL PC
021130  005037  002426          CLR     DISILO          ;CLEAR CURRENT STATE OF DISSI
021134  005037  002430          CLR     CHPTYP          ;CLEAR USYRT CHIP TYPE INDICATOR
021140  005037  002420          CLR     ERROR1          ;CLEAR ERROR FLAG
021144  005037  002432          CLR     SAVLEN          ;CLEAR CHAR LENGTH FROM SETUP
021150  005737  002412          TST     FRSTIM          ;SEE IF FIRST TIME THROUGH AFTER LOAD
021154  001007                  BNE     6$              ;BR IF NOT
021156  013737  000004  002414  MOV     @#4,SAVE4       ;SAVE ERROR TRAP VECTOR
021164  013737  000006  002416  MOV     @#6,SAVE6
021172  000406                  BR      9$
021174  013737  002414  000004  6$:     MOV     SAVE4,@#4       ;RESTORE ERROR TRAP VECTOR
021202  013737  002416  000006          MOV     SAVE6,@#6
021210  012737  000001  002412  9$:     MOV     #1,FRSTIM       ;MARK FLAG FOR NEXT TIME THROUGH
                        ;SEE IF PROGRAM JUST STARTED, BR IF YES
021216                          READEF  #EF.START
(3) 021216  012700  000040                                              MOV     #EF.START,R0
(3) 021222  104447                                                      TRAP    C$REFG
021224                          BCOMPLETE       STARST
(2) 021224  103415                                                      BCS     STARST
                        ;SEE IF PROGRAM JUST RESTARTED, BR IF YES
021226                          READEF  #EF.RESTART
(3) 021226  012700  000037                                              MOV     #EF.RESTART,R0
(3) 021232  104447                                                      TRAP    C$REFG
021234                          BCOMPLETE       STARST
(2) 021234  103411                                                      BCS     STARST
                        ;SEE IF THIS IS A NEW PASS, BR IF YES
021236                          READEF  #EF.NEW
(3) 021236  012700  000035                                              MOV     #EF.NEW,R0
(3) 021242  104447                                                      TRAP    C$REFG
021244                          BCOMPLETE       NEWST
(2) 021244  103411                                                      BCS     NEWST
                        ;SEE IF PROGRAM WAS JUST CONTINUED
021246                          READEF  #EF.CONTINUE
(3) 021246  012700  000036                                              MOV     #EF.CONTINUE,R0
(3) 021252  104447                                                      TRAP    C$REFG
021254                          BCOMPLETE       ENDIT
(2) 021254  103504                                                      BCS     ENDIT
021256  000414                  BR      GETPRM
021260                  STARST:
021260  005037  002444          CLR     STARES          ;CLEAR FLAG TO SHOW JUST HAD STA OR RES
                        ;CLEAR DEVICE MAP
021264  005037  002434          CLR     DEVMAP
021270                  NEWST:
021270  012737  177777  002344  MOV     #-1,LOGDEV      ;RESET LOGICAL DEVICE TO -1
021276  005237  002444          INC     STARES          ;INCR NO. OF PASSES SINCE STA OR RES
```

```
4669  021302  012737  000001  002436          MOV     #BIT0,DEVPTR    ;INIT DEVICE MAP BIT POINTER
4670                                  ; GET UNIBUS ADDRESS, VECTOR, PRIORITY LEVEL, SWITCH PACKS, TEST
4671                                  ;   CONNECTOR INFORMATION FOR THIS LOGICAL DEVICE
4672  021310                          GETPRM:
4673  021310  005237  002344                  INC     LOGDEV          ;INCREMENT LOGICAL DEVICE NUMBER
4674  021314  023737  002344  002012          CMP     LOGDEV,L$UNIT   ;SEE IF MAXIMUM UNIT NO. EXCEEDED
4675  021322  002362                          BGE     NEWST           ;BR IF YES
4676  021324                                  GPHARD  LOGDEV,R1       ;GET P-TABLE POINTER INTO R1
  (3) 021324  013700  002344                                                  MOV     LOGDEV,R0
  (3) 021330  104442                                                          TRAP    C$GPHRD
  (3) 021332  010001                                                          MOV     R0,R1
4677  021334                                  BCOMPLETE       10$     ;BR IF DEVICE AVAILABLE
  (2) 021334  103403                                                          BCS     10$
4678  021336  006337  002436                  ASL     DEVPTR          ;SHIFT DEVICE POINTER
4679  021342  000762                          BR      GETPRM          ;SKIP THIS DEVICE
4680  021344  053737  002436  002434  10$:    BIS     DEVPTR,DEVMAP   ;SET BIT FOR THIS DEVICE
4681  021352  006337  002436                  ASL     DEVPTR          ;SHIFT BIT POINTER
4682  021356  062701  000002                  ADD     #2,R1           ;INCREMENT R1 PAST MICROPROCESSOR TYPE
4683  021362  011137  002446                  MOV     (R1),MPCSR      ;STORE POINTER TO MICROPROCESSOR CSR'S
4684  021366  011137  002450                  MOV     (R1),BSEL1
4685  021372  005237  002450                  INC     BSEL1           ;GET POINTER TO BSEL1 (MAINTENANCE REGISTER)
4686  021376  013737  002450  002452          MOV     BSEL1,BSEL2
4687  021404  005237  002452                  INC     BSEL2           ;GET POINTER TO BSEL2
4688  021410  011137  002454                  MOV     (R1),SEL4
4689  021414  062737  000004  002454          ADD     #4,SEL4         ;GET POINTER TO SEL4
4690  021422  012137  002456                  MOV     (R1)+,SEL6
4691  021426  062737  000006  002456          ADD     #6,SEL6         ;STORE POINTER TO SEL6
4692  021434  011137  002460                  MOV     (R1),MPIVEC     ;GET MICROPROCESSOR INPUT INTRPT VECTOR
4693  021440  012137  002462                  MOV     (R1)+,MPOVEC
4694  021444  062737  000004  002462          ADD     #4,MPOVEC       ;GET MICROPROCESSOR OUTPUT INTRPT VECTOR
4695  021452  012137  002464                  MOV     (R1)+,MPRIOR    ;GET MICROPROCESSOR DEVICE PRIORITY
4696  021456  062701  000014                  ADD     #14,R1          ;POINT R1 TO RUN SWITCH INDICATOR
4697  021462  011137  002476                  MOV     (R1),RUNINH     ;GET STATE OF MICROPROCESSOR RUN SWITCH
4698  021466                          ENDIT:
4699  021466                                  ENDINIT
  (3) 021466                                                          L10015:
  (3) 021466  104411                                                          TRAP    C$INIT
4700
4701
4702
4703
4704
4705
```

```
                                .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.
                                ;////////////////////////////////////////////////////////////////////////////
021470                                  BGNAUTO
(3) 021470                                                                              L$AUTO::

                                ;ESTABLISH CPU PRIORITY = 7
021470                                  SETPRI  #PRI07
(3) 021470  012700  000340                                                                      MOV     #PRI07,R0
(3) 021474  104441                                                                              TRAP    C$SPRI
021476  012737  021520  000004        MOV     #6$,@#4         ;SET UP NON-EXISTENT MEMORY ERROR TRAP VECTOR
021504  012737  000340  000006        MOV     #PRI07,@#6
021512  005777  160730                TST     @MPCSR          ;ADDRESS SEL0
021516  000405                        BR      9$              ;TAKE THIS BR IF DEVICE RESPONDS

                                ;COME HERE IF DEVICE CSR IS NON-EXISTENT
021520  062706  000004        6$:     ADD     #4,SP           ;CLEAN UP THE STACK POINTER
021524                                  DODU    LOGDEV          ;DROP THIS UNIT FROM TESTING
(3) 021524  013700  002344                                                                      MOV     LOGDEV,R0
(3) 021530  104451                                                                              TRAP    C$DODU
021532  013737  002414  000004  9$:     MOV     SAVE4,@#4       ;RESTORE ERROR TRAP VECTOR
021540  013737  002416  000006          MOV     SAVE6,@#6
021546                                  ENDAUTO
(3) 021546                                                                              L10016:
(3) 021546  104461                                                                              TRAP    C$AUTO
```

```
 4732                                   .SBTTL  CLEANUP CODING SECTION
 4733
 4734                                   ;//////////////////////////////////////////////////////////////////////
 4735                                   ;/ THE CLEANUP CODING SECTION CONTAINS THE CODING THAT IS PERFORMED
 4736                                   ;/ AT THE END OF THE TEST SEQUENCE ON A PARTICULAR UNIT.
 4737                                   ;//////////////////////////////////////////////////////////////////////
 4738
 4739  021550                                   BGNCLN
  (3)  021550                                                                    L$CLEAN::
 4740
 4741
 4742  021550                                   ENDCLN
  (3)  021550                                                                    L10017:
  (3)  021550  104412                                                                    TRAP    C$CLEAN
 4743
 4744
 4745
 4746
 4747
```

```
                                .SBTTL  DROP UNIT SECTION

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

021552                                  BGNDU                                   L$DU::
                                ;ISSUE UNIBUS RESET TO CLEAN UP
021552                                  BRESET
021552  104433                                                                  TRAP    C$RESET
                                ;PRINT 'UNIT XX DROPPED''
021554                                  PRINTF  #FMT27,LOGDEV
021554  013746  002344                                                         MOV     LOGDEV,-(SP)
021560  012746  021602                                                         MOV     #FMT27,-(SP)
021564  012746  000002                                                         MOV     #2,-(SP)
021570  010600                                                                 MOV     SP,R0
021572  104417                                                                 TRAP    C$PNTF
021574  062706  000006                                                         ADD     #6,SP
021600                                  ENDDU
021600                                                                  L10020:
021600  104453                                                                 TRAP    C$DU

021602  047045  040445  047125  FMT27:  .ASCIZ  /%N%AUNIT %D2%A DROPPED%N/
021610  052111  022440  031104
021616  040445  042040  047522
021624  050120  042105  047045
021632     000
021634                          .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.
                                ;////////////////////////////////////////////////////////////////////////

021634                                  BGNAU
021634                                                                  L$AU::
021634                                  ENDAU
021634                                                                  L10021:
021634  104452                                                                  TRAP    C$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.
                        ;;*************************************************************************************
021636                  BGNTST
021636                                                                          T1::
                        ;ESTABLISH CPU PRIORITY = 7
                              SETPRI  #PRI07
021636  012700  000340                                                        MOV     #PRI07,R0
021642  104441                                                                TRAP    C$SPRI
021644  012737  021666  000004        MOV     #6$,@#4         ;SET UP NON-EXISTENT MEMORY ERROR TRAP VECTOR
021652  012737  000340  000006        MOV     #PRI07,@#6
021660  005777  160562                TST     @MPCSR          ;ADDRESS SEL0
021664  000406                        BR      9$              ;TAKE THIS BR IF DEVICE RESPONDS
                        ;COME HERE IF DEVICE CSR IS NON-EXISTENT
021666  062706  000004        6$:     ADD     #4,SP           ;CLEAN UP THE STACK POINTER
                        ;REPORT CSR ADDRESS TIME-OUT
021672                        ERRDF   1,EM1,ERR1
021672  104455                                                                TRAP    C$ERDF
021674  000001                                                                .WORD   1
021676  012127                                                                .WORD   EM1
021700  014602                                                                .WORD   ERR1
021702  013737  002414  000004  9$:     MOV     SAVE4,@#4       ;RESTORE ERROR TRAP VECTOR
021710  013737  002416  000006        MOV     SAVE6,@#6
021716                  ENDTST
021716                                                                  L10022:
021716  104401                                                                TRAP    C$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.
                        ;;*************************************************************************************
021720                  BGNTST
021720                                                                          T2::
021720  012737  000014  002400        MOV     #14,REGNUM      ;SET LU REG NO. = 14
021726  004737  003576                JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
021732  004737  003672                JSR     PC,READLU       ;READ REG 14
021736  123737  002364  003026        CMPB    REDBYT,PATM+4   ;CHK FOR INITIALIZED STATE
021744  001416                        BEQ     6$              ;BR IF YES
021746  005037  002404                CLR     GOODAT          ;SET EXPECTED REG CONTENTS = 000
021752  113737  003026  002404        MOVB    PATM+4,GOODAT   ;SET EXPECTED DATA
```

```
 4834  021760  013737  002364  002406          MOV     REDBYT,BADDAT   ;SET ACTUAL REG CONTENTS
 4835  021766  004737  004016                  JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
 4836                                  ;REPORT REG NOT CLEARED BY MASTER CLEAR
 4837  021772                                  ERRDF   2,EM2,ERR2
  (4)  021772  104455                                                             TRAP    C$ERDF
  (5)  021774  000002                                                             .WORD   2
  (5)  021776  012163                                                             .WORD   EM2
  (5)  022000  014634                                                             .WORD   ERR2
 4838  022002                          6$:
 4839  022002                          ENDTST
  (3)  022002                                                                  L10023:
  (3)  022002  104401                                                             TRAP    C$ETST
 4840
 4841
 4842
 4843
 4844
 4845                                  ;;*****************************************************************************
 4846                                  .SBTTL      TEST 3 - INBUS/OUTBUS REG 14 READ/WRITE BIT TEST
 4847                                  ;*
 4848                                  ;* WRITE, READ, AND COMPARE ALL WORDS OF DATA PATTERN A INTO REG 14,
 4849                                  ;* A BYTE AT A TIME. NON-R/W BITS ARE MASKED OFF TO 0 BEFORE WRITING AND
 4850                                  ;* READING.
 4851                                  ;*    DATA PATTERN A = 125,252,000,377,001,002,004,010,020,040,100,200,376,
 4852                                  ;*                     375,373,367,357,337,277,177.
 4853                                  ;;*****************************************************************************
 4854  022004                          BGNTST
  (3)  022004                                                                  T3::
 4855  022004  004737  003576                  JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
 4856  022010  012737  000014  002400          MOV     #14,REGNUM      ;SET LU REG NO. = 14
 4857  022016  012701  002571                  MOV     #PATA,R1        ;GET POINTER TO DATA PAT IN R1
 4858  022022                          3$:
 4859  022022                                  BGNSEG
  (3)  022022  104404                                                             TRAP    C$BSEG
 4860  022024  111137  002366                  MOVB    (R1),WRIBYT     ;GET A BYTE OF PAT A
 4861  022030  143737  002560  002366          BICB    R14NRW,WRIBYT   ;MASK OFF NON-READ/WRITE BITS
 4862  022036  004737  003750                  JSR     PC,WRITLU       ;WRITE DATA BYTE INTO REG 14
 4863  022042  004737  003672                  JSR     PC,READLU       ;READ DATA BYTE FROM REG 14
 4864  022046  143737  002560  002364          BICB    R14NRW,REDBYT   ;MASK OFF NON-READ/WRITE BITS
 4865  022054  123737  002364  002366          CMPB    REDBYT,WRIBYT   ;COMPARE BYTE READ TO BYTE WRITTEN
 4866  022062  001414                          BEQ     6$              ;BR IF BYTES MATCH
 4867  022064  013737  002366  002404          MOV     WRIBYT,GOODAT   ;SET EXPECTED REG CONTENTS
 4868  022072  013737  002364  002406          MOV     REDBYT,BADDAT   ;SET ACTUAL REG CONTENTS
 4869  022100  004737  004016                  JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
 4870                                  ;REPORT LINE UNIT REG MISCOMPARE
 4871  022104                                  ERRDF   3,EM3,ERR2
  (4)  022104  104455                                                             TRAP    C$ERDF
  (5)  022106  000003                                                             .WORD   3
  (5)  022110  012222                                                             .WORD   EM3
  (5)  022112  014634                                                             .WORD   ERR2
 4872  022114                          6$:
 4873  022114                                  ENDSEG
  (3)  022114                                                                  10000$:
  (3)  022114  104405                                                             TRAP    C$ESEG
 4874  022116  005201                          INC     R1              ;INCREMENT DATA PATTERN POINTER
 4875  022120  020127  002615                  CMP     R1,#PATB        ;SEE IF ALL WORDS OF PATTERN A USED YET
```

```
4876  022124  103736                        BLO     3$              ;BR IF NOT DONE YET
4877  022126                          ENDTST
 (3)  022126                                                                    L10024:
 (3)  022126  104401                                                                    TRAP    C$ETST
4878
4879
4880
4881
4882
4883                                    ;;**************************************************************************************
4884                                    .SBTTL      TEST 4 - REG 14 MASTER CLEAR TEST
4885                                    ;* WRITE 377 INTO REG 14, ISSUE MASTER CLEAR, READ REG 14 AND COMPARE
4886                                    ;* TO 200.
4887                                    ;;**************************************************************************************
4888  022130                            BGNTST
 (3)  022130                                                                    T4::
4889  022130  004737  003576                    JSR     PC,MSTCLR       ;PERFORM MASTER CLEAR
4890  022134  012737  000014  002400            MOV     #14,REGNUM      ;SET LU REG NO. = 14
4891  022142  112737  000377  002366            MOVB    #377,WRIBYT     ;SET DATA BYTE = 377
4892  022150  004737  003750                    JSR     PC,WRITLU       ;WRITE 377 INTO REG 14
4893  022154  004737  003576                    JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
4894  022160  004737  003672                    JSR     PC,READLU       ;READ REG 14
4895  022164  123737  002364  003026            CMPB    REDBYT,PATM+4   ;CHK FOR INIT'D STATE
4896  022172  001416                            BEQ     6$              ;BR IF REG GOT CLEARED
4897  022174  005037  002404                    CLR     GOODAT
4898  022200  113737  003026  002404            MOVB    PATM+4,GOODAT   ;SET EXPECTED DATA
4899  022206  013737  002364  002406            MOV     REDBYT,BADDAT   ;SET ACTUAL DATA
4900  022214  004737  004016                    JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
4901                                  ;REPORT REG NOT CLEARED BY MASTER CLEAR
4902  022220                                    ERRDF   2,EM2,ERR2
 (4)  022220  104455                                                                    TRAP    C$ERDF
 (5)  022222  000002                                                                    .WORD   2
 (5)  022224  012163                                                                    .WORD   EM2
 (5)  022226  014634                                                                    .WORD   ERR2
4903  022230                          6$:
4904  022230                          ENDTST
 (3)  022230                                                                    L10025:
 (3)  022230  104401                                                                    TRAP    C$ETST
4905
4906
4907
4908
4909
4910                                    ;;**************************************************************************************
4911                                    .SBTTL      TEST 5 - REG 14 UNIBUS RESET (INIT) TEST
4912                                    ;* WRITE 377 INTO REG 14, ISSUE UNIBUS RESET (INIT), READ REG 14 AND COMPARE
4913                                    ;* TO 200.
4914                                    ;;**************************************************************************************
4915  022232                            BGNTST
 (3)  022232                                                                    T5::
4916  022232  004737  003576                    JSR     PC,MSTCLR       ;PERFORM MASTER CLEAR
4917  022236  012737  000014  002400            MOV     #14,REGNUM      ;SET LU REG NO. = 14
4918  022244  112737  000377  002366            MOVB    #377,WRIBYT     ;SET DATA BYTE = 377
4919  022252  004737  003750                    JSR     PC,WRITLU       ;WRITE 377 INTO REG 14
4920  022256                                    BRESET                  ;ISSUE UNIBUS RESET (INIT)
 (3)  022256  104433                                                                    TRAP    C$RESET
```

```
 4921  022260  142777  000200  160162          BICB    #RUN,@BSEL1     ;CLEAR RUN BIT
 4922  022266  012701  000024                  MOV     #20.,R1         ;INIT LOOP COUNTER
 4923  022272  000240                  2$:     NOP
 4924  022274  005301                          DEC     R1              ;DECR COUNTER
 4925  022276  001375                          BNE     2$              ;BR TO STALL
 4926  022300  004737  003672                  JSR     PC,READLU       ;READ REG 14
 4927  022304  142737  000100  002364          BICB    #TXEN,REDBYT    ;CLEAR UNPREDICTABLE BIT
 4928  022312  123737  002364  003026          CMPB    REDBYT,PATM+4   ;CHK FOR INIT'D STATE
 4929  022320  001416                          BEQ     6$              ;BR IF REG GOT CLEARED
 4930  022322  005037  002404                  CLR     GOODAT
 4931  022326  113737  003026  002404          MOVB    PATM+4,GOODAT   ;SET EXPECTED DATA
 4932  022334  013737  002364  002406          MOV     REDBYT,BADDAT   ;SET ACTUAL DATA
 4933  022342  004737  004016                  JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
 4934                                  ;REPORT REG NOT CLEARED BY UNIBUS RESET (INIT)
 4935  022346                                  ERRDF   4,EM4,ERR2
   (4) 022346  104455                                                          TRAP    C$ERDF
   (5) 022350  000004                                                          .WORD   4
   (5) 022352  012241                                                          .WORD   EM4
   (5) 022354  014634                                                          .WORD   ERR2
 4936  022356                          6$:
 4937  022356                          ENDTST
   (3) 022356                                                          L10026:
   (3) 022356  104401                                                          TRAP    C$ETST
 4938
 4939
 4940
 4941
 4942
 4943                                  ;;*****************************************************************************
 4944                                  .SBTTL      TEST 6 - LINE UNIT FALSE SELECTION TEST
 4945                                  ;*
 4946                                  ;* FIRST, A MASTER CLEAR IS PERFORMED. THEN, THE PROGRAM SINGLE-STEPS THE
 4947                                  ;* MICROPROCESSOR THROUGH AN INSTRUCTION WHICH LOADS 041 (OCT) INTO THE MAR
 4948                                  ;* REGISTER (OBUS* ADRS 14). THEN, THE LINE UNIT REGISTER 14 IS READ AND CHECKED
 4949                                  ;* TO BE UNAFFECTED (STILL = 0). THIS TEST IS INTENDED TO DETECT A FALSE
 4950                                  ;* SELECTION OF THE LINE UNIT REGISTERS, WHEN THE LINE UNIT IS NOT BEING
 4951                                  ;* ACCESSED.
 4952                                  ;;*****************************************************************************
 4953  022360                          BGNTST
   (3) 022360                                                          T6::
 4954  022360  004737  003576                  JSR     PC,MSTCLR       ;ISSUE A MASTER CLEAR
 4955  022364  012737  000014  002400          MOV     #14,REGNUM      ;SET LU REG NO. = 14
 4956  022372  013701  002400                  MOV     REGNUM,R1       ;SET DESTINATION = OBUS* REG 14
 4957  022376  052701  000100                  BIS     #100,R1         ;SET SOURCE = BSEL4
 4958  022402  052701  121000                  BIS     #MVIXOX,R1      ;SET REST OF MOVE INSTRUCTION
 4959  022406  010137  022424                  MOV     R1,2$           ;SET INSTRUCTION AS SUBROUTINE ARGUMENT
 4960  022412  112777  000041  160034          MOVB    #041,@BSEL4     ;SET DATA BYTE = 041
 4961  022420  004737  003540                  JSR     PC,STPCLK       ;EXECUTE MOVE INSTRUCTION
 4962  022424  000000                  2$:     .WORD   0               ;INSTRUCTION GOES HERE
 4963  022426  004737  003672                  JSR     PC,READLU       ;READ LU REG 14
 4964  022432  123737  002364  003026          CMPB    REDBYT,PATM+4   ;CHECK FOR LU REG 14 UNCHANGED
 4965  022440  001416                          BEQ     4$              ;BR IF LU REG 14 UNCHANGED
 4966  022442  005037  002404                  CLR     GOODAT          ;SET EXPECTED DATA
 4967  022446  113737  003026  002404          MOVB    PATM+4,GOODAT
 4968  022454  013737  002364  002406          MOV     REDBYT,BADDAT   ;SET ACTUAL DATA
 4969  022462  004737  004016                  JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
```

```
                                ;REPORT REGISTER MISCOMPARE
022466                                  ERRDF   3,EM3,ERR2
(4)  022466  104455                                                     TRAP    C$ERDF
(5)  022470  000003                                                     .WORD   3
(5)  022472  012222                                                     .WORD   EM3
(5)  022474  014634                                                     .WORD   ERR2
022476                          4$:
022476                          ENDTST
(3)  022476                                                         L10027:
(3)  022476  104401                                                     TRAP    C$ETST
                                ;;*************************************************************************************
                                .SBTTL      TEST 7 - INBUS REG MASTER CLEAR TEST
                                ;*
                                ;* FIRST, ALL READ/WRITE BITS OF REGS 10-17 ARE SET BY LOADING A
                                ;* DIFFERENT WORD OF PATTERN G INTO EACH REG.  THEN,
                                ;* A MASTER CLEAR IS ISSUED AND EACH REG IS READ AND COMPARED TO A WORD OF
                                ;* PATTERN M, WHICH CONTAINS THE INITIALIZED STATES OF THE REGS. (UNPREDICTABLE
                                ;* BITS ARE MASKED OFF TO 0 BEFORE COMPARISON).
                                ;*   PATTERN G = 000,000,240,120,177,000,000,001
                                ;*   PATTERN M = 000,020,000,000,200,000,000,051
                                ;;*************************************************************************************
022500                          BGNTST
(3)  022500                                                         T7::
022500  004737  003576                JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
022504  012737  000010  002400        MOV     #10,REGNUM      ;INIT REG NO. TO 10
022512  012701  002644                MOV     #PATG,R1        ;INIT DATA PATTERN POINTER
022516  112137  002366        2$:     MOVB    (R1)+,WRIBYT    ;SET DATA PATTERN BYTE TO BE WRITTEN
022522  004737  003750                JSR     PC,WRITLU       ;WRITE BYTE INTO REG
022526  005237  002400                INC     REGNUM          ;INCREMENT REG NO. FOR WRITING
022532  020127  002654                CMP     R1,#PATH        ;SEE IF ALL BYTES WRITTEN YET
022536  103767                      BLO     2$              ;BR IF NOT DONE WRITING YET
022540  004737  003576                JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
022544  012737  000010  002400        MOV     #10,REGNUM      ;INIT LU REG NO. TO 10
022552  012702  003022                MOV     #PATM,R2        ;INIT DATA PATTERN POINTER
022556  012701  002550                MOV     #UPBITS,R1      ;INIT POINTER TO UNPREDICTABLE BITS
022562                          3$:
022562  004737  003672                JSR     PC,READLU       ;READ A LINE UNIT REG
022566  142137  002364                BICB    (R1)+,REDBYT    ;MASK OUT UNPREDICTABLE BITS FOR THIS REG
022572  123712  002364                CMPB    REDBYT,(R2)     ;COMPARE MASKED DATA TO EXPECTED
022576  001417                      BEQ     6$              ;BR IF DATA READ IS OK
022600  005037  002404                CLR     GOODAT
022604  111237  002404                MOVB    (R2),GOODAT     ;SET EXPECTED DATA
022610  013737  002364  002406        MOV     REDBYT,BADDAT   ;SET ACTUAL DATA
022616  004737  004016                JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
                                ;REPORT REG NOT CLEARED BY MASTER CLEAR
022622                                  ERRDF   2,EM2,ERR2
(4)  022622  104455                                                     TRAP    C$ERDF
(5)  022624  000002                                                     .WORD   2
(5)  022626  012163                                                     .WORD   EM2
(5)  022630  014634                                                     .WORD   ERR2
022632                                  ESCAPE  TST
```

```
  (3)  022632  104410                                                          !RAP    C$ESCAPE
  (3)  022634  000016                                                          .WORD   L10030-.
5015   022636  005237  002400        6$:     INC     REGNUM          ;INCREMENT REG NO.
5016   022642  005202                INC     R2              ;INCR DATA PATTERN POINTER
5017   022644  020227  003032        CMP     R2,#PATN        ;SEE IF ALL DONE YET
5018   022650  103744                BLO     3$              ;BR IF NOT DONE YET
5019   022652                      ENDTST
  (3)  022652                                                                L10030:
  (3)  022652  104401                                                          TRAP    C$ETST
5020
5021
5022
5023
5024
5025                               ;;*******************************************************************************
5026                               .SBTTL      TEST 8 - REGISTER 10-17 ADDRESSING TEST
5027                               ;*
5028                               ;* FIRST, A MASTER CLEAR IS ISSUED. THEN,
5029                               ;* WRITE A DIFFERENT WORD OF DATA PATTERN B INTO EACH OF REGS 10-17,
5030                               ;* AND AFTER EACH WRITE, READ AND COMPARE ALL REGS TO EXPECTED VALUES.
5031                               ;* UNPREDICTABLE BITS ARE MASKED OFF TO 0 WHEN READ FOR COMPARISON.
5032                               ;*    PATTERN B = 000,000,040,100,220,000,000,051
5033                               ;;*******************************************************************************
5034   022654                      BGNTST
  (3)  022654                                                                T8::
5035   022654  004737  003576                JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
5036   022660  012701  002500                MOV     #REDDAT,R1      ;INIT POINTER TO EXPECTED DATA AREA
5037   022664  012702  003022                MOV     #PATM,R2        ;GET POINTER TO PATTERN M
5038   022670  012703  000010                MOV     #8.,R3          ;SET COUNTER
5039   022674  112221          3$:     MOVB    (R2)+,(R1)+     ;LOAD BYTE OF PATRN INTO EXPECTED DATA AREA
5040   022676  005303                DEC     R3              ;DECR COUNTER
5041   022700  001375                BNE     3$              ;BR IF NOT DONE LOADING YET
5042   022702  005001                CLR     R1              ;INIT DATA PATTERN INDEX FOR WRITING
5043   022704  010137  002400        6$:     MOV     R1,REGNUM
5044   022710  062737  000010  002400        ADD     #10,REGNUM      ;GET REG NO. FOR WRITING
5045   022716  116137  002615  002366        MOVB    PATB(R1),WRIBYT ;SET DATA BYTE TO BE WRITTEN
5046   022724  113761  002366  002500        MOVB    WRIBYT,REDDAT(R1) ;SET EXPECTED DATA FOR READ
5047   022732  146161  002550  002500        BICB    UPBITS(R1),REDDAT(R1) ;MASK OUT UNPREDICTABLE BITS
5048   022740  004737  003750                JSR     PC,WRITLU       ;WRITE DATA BYTE INTO REG
5049   022744  005003                CLR     R3              ;INIT DATA PAT INDEX FOR READS
5050   022746  010337  002400        9$:     MOV     R3,REGNUM
5051   022752  062737  000010  002400        ADD     #10,REGNUM      ;GET REG NO. FOR READING
5052   022760  004737  003672                JSR     PC,READLU       ;READ A LINE UNIT REG
5053   022764  146337  002550  002364        BICB    UPBITS(R3),REDBYT ;MASK OUT UNPREDICTABLE BITS
5054   022772  023727  002400  000011        CMP     REGNUM,#11      ;SEE IF READING REG 11
5055   023000  001006                BNE     10$             ;BR IF NOT
5056   023002  142737  000020  002364        BICB    #ORDY,REDBYT    ;MASK ORDY BIT IN ACTUAL BYTE
5057   023010  142763  000020  002500        BICB    #ORDY,REDDAT(R3) ;MASK ORDY BIT IN EXPECTED BYTE
5058   023016  123763  002364  002500 10$:    CMPB    REDBYT,REDDAT(R3) ;COMPARE BYTE READ TO EXPECTED
5059   023024  001420                BEQ     12$             ;BR IF DATA MATCHES
5060   023026  005037  002404                CLR     GOODAT
5061   023032  116337  002500  002404        MOVB    REDDAT(R3),GOODAT ;SET EXPECTED DATA
5062   023040  013737  002364  002406        MOV     REDBYT,BADDAT   ;SET ACTUAL DATA
5063   023046  004737  004016                JSR     PC,GETREG       ;READ AND STORE REGS 10-17 FOR PRINTOUT
5064                              ;REPORT REG MISCOMPARE
5065   023052                              ERRDF   3,EM3,ERR2
```

```
 (4)  023052  104455                                                    TRAP    C$ERDF
 (5)  023054  000003                                                    .WORD   3
 (5)  023056  012222                                                    .WORD   EM3
 (5)  023060  014634                                                    .WORD   ERR2
5066  023062                  ESCAPE  TST
 (3)  023062  104410                                                    TRAP    C$ESCAPE
 (3)  023064  000022                                                    .WORD   L10031-.
5067  023066  005203          12$:    INC     R3              ;INCREMENT DATA PATTERN INDEX FOR READING
5068  023070  020327  000010          CMP     R3,#10          ;SEE IF ALL REGS READ YET
5069  023074  002724                  BLT     9$              ;BR IF NOT
5070  023076  005201                  INC     R1              ;INCREMENT DATA PAT INDEX FOR WRITING
5071  023100  020127  000010          CMP     R1,#10          ;SEE IF ALL REGS WRITTEN YET
5072  023104  002677                  BLT     6$              ;BR IF NOT
5073  023106                  ENDTST
 (3)  023106                                                                    L10031:
 (3)  023106  104401                                                                    TRAP    C$ETST
5074
5075
5076
5077
5078
5079                    ;;*******************************************************************************
5080                    .SBTTL      TEST 9 - REG 11 READ/WRITE BIT TEST
5081                    ;*
5082                    ;* WRITE, READ, AND COMPARE EACH WORD OF DATA PATTERN C INTO REG 11 :
5083                    ;*      DATA PATTERN C = 020,020,020.
5084                    ;;*******************************************************************************
5085  023110            BGNTST
 (3)  023110                                                                    T9::
5086  023110  004737  003576          JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
5087  023114  012737  000011  002400  MOV     #11,REGNUM      ;SET LU REG NO. = 11
5088  023122  012701  002625          MOV     #PATC,R1        ;GET POINTER TO DATA PAT IN R1
5089  023126                  3$:
5090  023126                  BGNSEG
 (3)  023126  104404                                                                    TRAP    C$BSEG
5091  023130  111137  002366          MOVB    (R1),WRIBYT     ;GET A BYTE OF PAT C
5092  023134  004737  003750          JSR     PC,WRITLU       ;WRITE DATA BYTE INTO REG 11
5093  023140  004737  003672          JSR     PC,READLU       ;READ DATA BYTE FROM REG 11
5094  023144  143737  002551  002364  BICB    UPBITS+1,REDBYT ;MASK OUT UNPREDICTABLE BITS
5095  023152  123737  002364  002366  CMPB    REDBYT,WRIBYT   ;COMPARE BYTE READ TO BYTE WRITTEN
5096  023160  001414                  BEQ     6$              ;BR IF BYTES MATCH
5097  023162  013737  002366  002404  MOV     WRIBYT,GOODAT   ;SET EXPECTED REG CONTENTS
5098  023170  013737  002364  002406  MOV     REDBYT,BADDAT   ;SET ACTUAL REG CONTENTS
5099  023176  004737  004016          JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
5100                  ;REPORT LINE UNIT REG MISCOMPARE
5101  023202                  ERRDF   3,EM3,ERR2
 (4)  023202  104455                                                    TRAP    C$ERDF
 (5)  023204  000003                                                    .WORD   3
 (5)  023206  012222                                                    .WORD   EM3
 (5)  023210  014634                                                    .WORD   ERR2
5102  023212                  6$:
5103  023212                  ENDSEG
 (3)  023212                                                                    10000$:
 (3)  023212  104405                                                                    TRAP    C$ESEG
5104  023214  005201          INC     R1              ;INCREMENT DATA PATTERN POINTER
5105  023216  020127  002630  CMP     R1,#PATD        ;SEE IF ALL WORDS OF PATTERN C USED YET
```

```
 5106  023222  103741                        BLO     3$              ;BR IF NOT DONE YET
 5107  023224                        ENDTST
   (3) 023224                                                                L10032:
   (3) 023224  104401                                                              TRAP    C$ETST
 5108
 5109
 5110
 5111
 5112
 5113                                ;;*************************************************************************************
 5114                                .SBTTL      TEST 10 - REG 12 READ/WRITE BIT TEST
 5115                                ;*
 5116                                ;* WRITE, READ, AND COMPARE EACH WORD OF DATA PATTERN D INTO REG 12 :
 5117                                ;*      DATA PATTERN D = 000,040,000.
 5118                                ;;*************************************************************************************
 5119  023226                        BGNTST
   (3) 023226                                                                T10::
 5120  023226  004737  003576                JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
 5121  023232  012737  000012  002400        MOV     #12,REGNUM      ;SET LU REG NO. = 12
 5122  023240  012701  002630                MOV     #PATD,R1        ;GET POINTER TO DATA PAT IN R1
 5123  023244                        3$:
 5124  023244                                BGNSEG
   (3) 023244  104404                                                              TRAP    C$BSEG
 5125  023246  111137  002366                MOVB    (R1),WRIBYT     ;GET A BYTE OF PAT D
 5126  023252  004737  003750                JSR     PC,WRITLU       ;WRITE DATA BYTE INTO REG 12
 5127  023256  004737  003672                JSR     PC,READLU       ;READ DATA BYTE FROM REG 12
 5128  023262  143737  002552  002364        BICB    UPBITS+2,REDBYT ;MASK OUT UNPREDICTABLE BITS
 5129
 5130  023270  123737  002364  002366        CMPB    REDBYT,WRIBYT   ;COMPARE BYTE READ TO BYTE WRITTEN
 5131  023276  001414                        BEQ     6$              ;BR IF BYTES MATCH
 5132  023300  013737  002366  002404        MOV     WRIBYT,GOODAT   ;SET EXPECTED REG CONTENTS
 5133  023306  013737  002364  002406        MOV     REDBYT,BADDAT   ;SET ACTUAL REG CONTENTS
 5134  023314  004737  004016                JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
 5135                                ;REPORT LINE UNIT REG MISCOMPARE
 5136  023320                                ERRDF   3,EM3,ERR2
   (4) 023320  104455                                                              TRAP    C$ERDF
   (5) 023322  000003                                                              .WORD   3
   (5) 023324  012222                                                              .WORD   EM3
   (5) 023326  014634                                                              .WORD   ERR2
 5137  023330                        6$:
 5138  023330                                ENDSEG
   (3) 023330                                                                10000$:
   (3) 023330  104405                                                              TRAP    C$ESEG
 5139  023332  005201                        INC     R1              ;INCREMENT DATA PATTERN POINTER
 5140  023334  020127  002633                CMP     R1,#PATE        ;SEE IF ALL WORDS OF PATTERN D USED YET
 5141  023340  103741                        BLO     3$              ;BR IF NOT DONE YET
 5142  023342                        ENDTST
   (3) 023342                                                                L10033:
   (3) 023342  104401                                                              TRAP    C$ETST
 5143
 5144
 5145
 5146
 5147
 5148                                ;;*************************************************************************************
 5149                                .SBTTL      TEST 11 - REG 13 READ/WRITE BIT TEST
```

```
                                        ;*
                                        ;* WRITE, READ, AND COMPARE EACH WORD OF DATA PATTERN E INTO REG 13 :
                                        ;*      DATA PATTERN E = 000,120,020,100,120,000.
                                        ;;*****************************************************************************
5154  023344                            BGNTST
 (3)  023344                                                                        T11::
5155  023344  004737  003576                   JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
5156  023350  012737  000013  002400           MOV     #13,REGNUM      ;SET LU REG NO. = 13
5157  023356  012701  002633                   MOV     #PATE,R1        ;GET POINTER TO DATA PAT IN R1
5158  023362                            3$:
5159  023362                                   BGNSEG
 (3)  023362  104404                                                                TRAP    C$BSEG
5160  023364  111137  002366                   MOVB    (R1),WRIBYT     ;GET A BYTE OF PAT E
5161  023370  004737  003750                   JSR     PC,WRITLU       ;WRITE DATA BYTE INTO REG 13
5162  023374  004737  003672                   JSR     PC,READLU       ;READ DATA BYTE FROM REG 13
5163  023400  143737  002553  002364           BICB    UPBITS+3,REDBYT ;MASK OUT UNPREDICTABLE BITS
5164  023406  123737  002364  002366           CMPB    REDBYT,WRIBYT   ;COMPARE BYTE READ TO BYTE WRITTEN
5165  023414  001414                           BEQ     6$              ;BR IF BYTES MATCH
5166  023416  013737  002366  002404           MOV     WRIBYT,GOODAT   ;SET EXPECTED REG CONTENTS
5167  023424  013737  002364  002406           MOV     REDBYT,BADDAT   ;SET ACTUAL REG CONTENTS
5168  023432  004737  004016                   JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
5169                                  ;REPORT LINE UNIT REG MISCOMPARE
5170  023436                                   ERRDF   3,EM3,ERR2
 (4)  023436  104455                                                                TRAP    C$ERDF
 (5)  023440  000003                                                                .WORD   3
 (5)  023442  012222                                                                .WORD   EM3
 (5)  023444  014634                                                                .WORD   ERR2
5171  023446                            6$:
5172  023446                                   ENDSEG
 (3)  023446                                                                        10000$:
 (3)  023446  104405                                                                TRAP    C$ESEG
5173  023450  005201                           INC     R1              ;INCREMENT DATA PATTERN POINTER
5174  023452  020127  002641                   CMP     R1,#PATF        ;SEE IF ALL WORDS OF PATTERN E USED YET
5175  023456  103741                           BLO     3$              ;BR IF NOT DONE YET
5176  023460                            ENDTST
 (3)  023460                                                                        L10034:
 (3)  023460  104401                                                                TRAP    C$ETST
5177
5178
5179
5180
5181
5182                                    ;;*****************************************************************************
5183                                    .SBTTL      TEST 12 - REG 17 READ/WRITE BIT TEST
5184                                    ;*
5185                                    ;* WRITE, READ, AND COMPARE EACH WORD OF DATA PATTERN F INTO REG 17 :
5186                                    ;*      DATA PATTERN F = 050,051,050.
5187                                    ;;*****************************************************************************
5188  023462                            BGNTST
 (3)  023462                                                                        T12::
5189  023462  004737  003576                   JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
5190  023466  012737  000017  002400           MOV     #17,REGNUM      ;SET LU REG NO. = 17
5191  023474  012701  002641                   MOV     #PATF,R1        ;GET POINTER TO DATA PAT IN R1
```

```
 5193  023500                          3$:
 5194  023500                                  BGNSEG
  (3)  023500  104404                                                                    TRAP    C$BSEG
 5195  023502  111137  002366                  MOVB    (R1),WRIBYT     ;GET A BYTE OF PAT F
 5196  023506  004737  003750                  JSR     PC,WRITLU       ;WRITE DATA BYTE INTO REG 17
 5197  023512  004737  003672                  JSR     PC,READLU       ;READ DATA BYTE FROM REG 17
 5198  023516  143737  002557  002364          BICB    UPBITS+7,REDBYT ;MASK OUT UNPREDICTABLE BITS
 5199  023524  123737  002364  002366          CMPB    REDBYT,WRIBYT   ;COMPARE BYTE READ TO BYTE WRITTEN
 5200  023532  001414                          BEQ     6$              ;BR IF BYTES MATCH
 5201  023534  013737  002366  002404          MOV     WRIBYT,GOODAT   ;SET EXPECTED REG CONTENTS
 5202  023542  013737  002364  002406          MOV     REDBYT,BADDAT   ;SET ACTUAL REG CONTENTS
 5203  023550  004737  004016                  JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
 5204                                  ;REPORT LINE UNIT REG MISCOMPARE
 5205  023554                                  ERRDF   3,EM3,ERR2
  (4)  023554  104455                                                                    TRAP    C$ERDF
  (5)  023556  000003                                                                    .WORD   3
  (5)  023560  012222                                                                    .WORD   EM3
  (5)  023562  014634                                                                    .WORD   ERR2
 5206  023564                          6$:
 5207  023564                                  ENDSEG
  (3)  023564                                                                  10000$:
  (3)  023564  104405                                                                    TRAP    C$ESEG
 5208  023566  005201                          INC     R1              ;INCREMENT DATA PATTERN POINTER
 5209  023570  020127  002644                  CMP     R1,#PATG        ;SEE IF ALL WORDS OF PATTERN F USED YET
 5210  023574  103741                          BLO     3$              ;BR IF NOT DONE YET
 5211  023576                          ENDTST
  (3)  023576                                                                  L10035:
  (3)  023576  104401                                                                    TRAP    C$ETST
 5212
 5213
 5214
 5215
 5216
 5217
 5218                                  ;;********************  **********************************************************************
 5219                                  .SBTTL      TEST 13 - .AINTENANCE CLOCK BIT TEST
 5220                                  ;*
 5221                                  ;* FIRST, A MASTER CLEAR IS ISSUED TO INIT ALL REGS. THEN, THE MICROPROCESSOR
 5222                                  ;* IS PLACED IN A LOOP ON AN INSTRUCTION, BY SETTING THE INSTRUCTION IN SEL6
 5223                                  ;* AND SETTING ROMI AND RUN IN BSEL1. THE INSTRUCTION IS ONE WHICH REPETITIVELY
 5224                                  ;* READS LINE UNIT REG 17 INTO BSEL2. THE PDP-11 CAN THEN SCAN BSEL2 TO MONITOR
 5225                                  ;* THE MAINTENANCE CLOCK BIT, MCLK. THE FOLLOWING SEQUENCE IS THEN PERFORMED
 5226                                  ;* TO MONITOR MCLK :
 5227                                  ;* - THE PROGRAM REPEATEDLY CHECKS THE MCLK BIT FOR THE 1 STATE, AND IF IT IS
 5228                                  ;*   NOT FOUND WITHIN SEVERAL HUNDRED MILLI-SEC (DEPENDING ON THE PROCESSOR)
 5229                                  ;*   AN ERROR IS REPORTED. (THE MAINTENANCE CLOCK HAS A PERIOD OF 41.6 MICRO-
 5230                                  ;*   SEC).
 5231                                  ;* - THE PROGRAM NEXT REPEATEDLY CHECKS THE MCLK BIT FOR THE 0 STATE, AND IF
 5232                                  ;*   IT IS NOT FOUND WITHIN SEVERAL HUNDRED MILLI-SEC AN ERROR IS REPORTED.
 5233                                  ;* - THE PROGRAM NEXT REPEATEDLY CHECKS MCLK BIT FOR THE 1 STATE AGAIN, AND
 5234                                  ;*   IF IT IS NOT FOUND WITHIN SEVERAL HUNDRED MILLI-SEC, AN ERROR IS REPORTED.
 5235                                  ;*
 5236                                  ;* IF THE P-TABLE FOR THIS UNIT INDICATES THAT THE MICROPROCESSOR RUN SWITCH
 5237                                  ;* IS NOT ON, THE TEST WILL BE SKIPPED.
 5238  023600                          ;;**********************************************************************************
  (3)  023600                          BGNTST
                                                                               T13::
```

```
5239  023600  004737  003576                JSR     PC,MSTCLR       ;PERFORM MASTER CLEAR
5240  023604  012737  000015  002442        MOV     #13.,TSTNUM     ;SET TEST NO.
5241  023612  005737  002476                TST     RUNINH          ;SEE IF RUN SWITCH IS SET
5242  023616  001020                        BNE     1$              ;BR IF YES, TO RUN TEST
5243  023620  023727  002444  000001        CMP     STARES,#1       ;SEE IF THIS IS FIRST PASS SINCE STA OR RES
5244  023626  001012                        BNE     40$             ;BR IF NOT, TO SKIP PRINTING
5245  023630                                PRINTF  #FMT19,TSTNUM   ;PRINT MSG TO SAY TEST NOT RUN
  (8) 023630  013746  002442                                                    MOV     TSTNUM,-(SP)
  (7) 023634  012746  012007                                                    MOV     #FMT19,-(SP)
  (6) 023640  012746  000002                                                    MOV     #2,-(SP)
  (3) 023644  010600                                                            MOV     SP,R0
  (4) 023646  104417                                                            TRAP    C$PNTF
  (4) 023650  062706  000006                                                    ADD     #6,SP
5246  023654  000137  024222        40$:    JMP     A1              ;GO TO SKIP TEST
5247  023660  012737  000017  002400  1$:     MOV     #17,REGNUM      ;SET REG NO. = 17
5248  023666  012701  000360                MOV     #360,R1         ;SET INSTRUCTION SOURCE = INBUS REG 17
5249  023672  052701  000002                BIS     #2,R1           ;SET INSTRUCTION DESTINATION = BSEL2
5250  023676  052701  021000                BIS     #MVIOX,R1       ;SET REST OF MOVE INSTRUCTION
5251  023702  010137  023712                MOV     R1,2$           ;SET INSTRUCTION AS SUBROUTINE ARGUMENT
5252  023706  004737  004074                JSR     PC,LOOPIN       ;GET MICROPROCESSOR LOOPING ON MOVE INSTRUCTION
5253  023712  000000                2$:     .WORD   0               ;INSTRUCTION GOES HERE
5254
5255                                        ;-------------------------------------------------------------------------
5256                                        ; WAIT FOR MCLK BIT TO BE SET TO 1
5257                                        ;-------------------------------------------------------------------------
5258  023714  005037  002510                CLR     REG0            ;INIT PROGRAM TIMER
5259  023720  117737  156526  002364  3$:     MOVB    @BSEL2,REDBYT   ;GET REG 17 INTO REDBYT
5260  023726  132737  000002  002364        BITB    #MCLK,REDBYT    ;SEE IF MCLK BIT = 1 YET
5261  023734  001031                        BNE     6$              ;BR IF MCLK = 1
5262  023736  005237  002510                INC     REG0            ;INCREMENT TIMER
5263  023742  001366                        BNE     3$              ;BR IF PROGRAM TIMER DID NOT TIME OUT YET
5264                                                                ; (TIME OUT = SEVERAL HUNDRED MILLI-SEC)
5265  023744  012737  000002  002404        MOV     #MCLK,GOODAT    ;SET EXPECTED REG CONTENTS
5266  023752  013737  002364  002406        MOV     REDBYT,BADDAT   ;SET ACTUAL REG CONTENTS
5267  023760  004737  004016                JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
5268                                ;REPORT MCLK BIT STUCK AT 0
5269  023764                                ERRDF   5,EM5,ERR2
  (4) 023764  104455                                                            TRAP    C$ERDF
  (5) 023766  000005                                                            .WORD   5
  (5) 023770  012314                                                            .WORD   EM5
  (5) 023772  014634                                                            .WORD   ERR2
5270                                ;TYPE 'PLEASE INSURE MICROPROCESSOR RUN SWITCH IS ON''
5271  023774                                PRINTF  #FMT24
  (7) 023774  012746  012040                                                    MOV     #FMT24,-(SP)
  (6) 024000  012746  000001                                                    MOV     #1,-(SP)
  (3) 024004  010600                                                            MOV     SP,R0
  (4) 024006  104417                                                            TRAP    C$PNTF
  (4) 024010  062706  000004                                                    ADD     #4,SP
5272  024014  000137  024222                JMP     A1              ;ESCAPE TO END OF TEST
5273
5274                                        ;-------------------------------------------------------------------------
5275                                        ; WAIT FOR MCLK BIT TO BE CLEARED TO 0
5276                                        ;-------------------------------------------------------------------------
5277  024020                                6$:
5278  024020  005037  002510                CLR     REG0            ;INIT PROGRAM TIMER
5279  024024  117737  156422  002364  8$:     MOVB    @BSEL2,REDBYT   ;GET REG 17 INTO REDBYT
```

```
5280  024032  132737  000002  002364          BITB    #MCLK,REDBYT    ;SEE IF MCLK BIT = 0 YET
5281  024040  001430                          BEQ     10$             ;BR IF MCLK = 0
5282  024042  005237  002510                  INC     REG0            ;INCREMENT TIMER
5283  024046  001366                          BNE     8$              ;BR IF TIMER DID NOT TIME OUT YET
5284  024050  005037  002404                  CLR     GOODAT          ;SET EXPECTED REG CONTENTS
5285  024054  013737  002364  002406          MOV     REDBYT,BADDAT   ;SET ACTUAL REG CONTENTS
5286  024062  004737  004016                  JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
5287                                  ;REPORT MCLK BIT STUCK AT 1
5288  024066                                  ERRDF   6,EM6,ERR2
  (4) 024066  104455                                                              TRAP    C$ERDF
  (5) 024070  000006                                                              .WORD   6
  (5) 024072  012345                                                              .WORD   EM6
  (5) 024074  014634                                                              .WORD   ERR2
5289                                  ;TYPE 'PLEASE INSURE MICROPROCESSOR RUN SWITCH IS ON'
5290  024076                                  PRINTF  #FMT24
  (7) 024076  012746  012040                                                      MOV     #FMT24,-(SP)
  (6) 024102  012746  000001                                                      MOV     #1,-(SP)
  (3) 024106  010600                                                              MOV     SP,R0
  (4) 024110  104417                                                              TRAP    C$PNTF
  (4) 024112  062706  000004                                                      ADD     #4,SP
5291  024116  000137  024222                  JMP     A1              ;ESCAPE TO END OF TEST
5292
5293                                  ;-------------------------------------------------------------------------------
5294                                  ; WAIT FOR MCLK BIT TO BE SET TO 1 AGAIN
5295                                  ;-------------------------------------------------------------------------------
5296  024122                          10$:
5297  024122  005037  002510                  CLR     REG0            ;INIT PROGRAM TIMER
5298  024126  117737  156320  002364  12$:     MOVB    @#SEL2,REDBYT   ;GET REG 17 INTO REDBYT
5299  024134  132737  000002  002364          BITB    #MCLK,REDBYT    ;SEE IF MCLK BIT = 1 YET
5300  024142  001027                          BNE     A1              ;BE IF MCLK = 1
5301  024144  005237  002510                  INC     REG0            ;INCREMENT TIMER
5302  024150  001366                          BNE     12$             ;BR IF TIMER DID NOT TIME OUT YET
5303  024152  012737  000002  002404          MOV     #MCLK,GOODAT    ;SET EXPECTED REG CONTENTS
5304  024160  013737  002364  002406          MOV     REDBYT,BADDAT   ;SET ACTUAL REG CONTENTS
5305  024166  004737  004016                  JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
5306                                  ;REPORT MCLK BIT STUCK AT 0
5307  024172                                  ERRDF   5,EM5,ERR2
  (4) 024172  104455                                                              TRAP    C$ERDF
  (5) 024174  000005                                                              .WORD   5
  (5) 024176  012314                                                              .WORD   EM5
  (5) 024200  014634                                                              .WORD   ERR2
5308                                  ;TYPE 'PLEASE INSURE MICROPROCESSOR RUN SWITCH IS ON'
5309  024202                                  PRINTF  #FMT24
  (7) 024202  012746  012040                                                      MOV     #FMT24,-(SP)
  (6) 024206  012746  000001                                                      MOV     #1,-(SP)
  (3) 024212  010600                                                              MOV     SP,R0
  (4) 024214  104417                                                              TRAP    C$PNTF
  (4) 024216  062706  000004                                                      ADD     #4,SP
5310  024222                          A1:
5311  024222  004737  003576                  JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
5312  024226                          ENDTST
  (3) 024226                                                                  L10036:
  (3) 024226  104401                                                              TRAP    C$ETST
5313
5314
5315
```

```
                                ;;*****************************************************************************************
                                .SBTTL      TEST 14 - EXTENDED REGISTER MASTER CLEAR TEST
                                ;*
                                ;* FIRST, ALL READ/WRITE BITS OF EXTENDED REGS AX0-AX3 ARE SET BY LOADING
                                ;* A DIFFERENT WORD OF PATTERN H INTO EACH REG. THEN, A MASTER CLEAR IS
                                ;* ISSUED AND EACH REG IS READ AND COMPARED TO A WORD OF PATTERN I, WHICH
                                ;* CONTAINS THE INITIALIZED STATES OF ALL THE EXTENDED REGS.
                                ;*    PATTERN H = 000,000,377,017,377,377,375,377
                                ;*    PATTERN I = 000,000,000,000,000,103,000,000
                                ;;*****************************************************************************************
                                BGNTST
                                                                                        T14::
                                        JSR     PC,MSTCLR       ;ISSUE AN INITIAL MASTER CLEAR
                                        CLR     AXNUM           ;INIT AX REG BYTE NO. TO 0
                                        MOV     #PATH,R1        ;INIT DATA PATTERN POINTER
                                1$:     MOVB    (R1)+,WAX15     ;SET BITS TO LOAD INTO LO BYTE
                                        MOVB    (R1)+,WAX16     ;SET BITS TO LOAD INTO HI BYTE
                                        JSR     PC,WRITAX       ;WRITE EXTENDED REG
                                        BIT     #WRDYTO,ERROR1  ;SEE IF READY FAILED TO SET
                                        BEQ     8$              ;BR IF NOT
                                        MOV     #14,REGNUM      ;SET LU REG NO = 14
                                        JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
                                ;REPORT READY NOT SET AFTER AX REG WRITE
                                        ERRDF   52,EM52,ERR9
(4)  024302  104455                                                             TRAP    C$ERDF
(5)  024304  000064                                                             .WORD   52
(5)  024306  014107                                                             .WORD   EM52
(5)  024310  020632                                                             .WORD   ERR9
                                        ESCAPE  TST
(3)  024312  104410                                                             TRAP    C$ESCAPE
(3)  024314  000244                                                             .WORD   L10037-.
                                8$:     ADD     #2,AXNUM        ;INCR REG BYTE NO.
                                        CMP     R1,#PATI        ;SEE IF ALL REGS WRITTEN YET
                                        BLO     1$              ;BR IF NOT DONE WRITING YET
                                        JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
                                        CLR     AXNUM           ;INIT EXTENDED REG BYTE NO. TO 0
                                        MOV     #PATI,R1        ;INIT DATA PAT POINTER FOR READS
                                2$:     JSR     PC,READAX       ;READ AN EXTENDED REG
                                        BIT     #RRDYTO,ERROR1  ;SEE IF READY FAILED TO SET
                                        BEQ     10$             ;BR IF NOT
                                        MOV     #14,REGNUM      ;SET LU REG NO. = 14
                                        JSR     PC,GETREG       ;GET REGS FOR PRINTOUT
                                ;REPORT READY NOT SET AFTER AX REG READ
                                        ERRDF   53,EM53,ERR9
(4)  024374  104455                                                             TRAP    C$ERDF
(5)  024376  000065                                                             .WORD   53
(5)  024400  014150                                                             .WORD   EM53
(5)  024402  020632                                                             .WORD   ERR9
                                        ESCAPE  TST
(3)  024404  104410                                                             TRAP    C$ESCAPE
(3)  024406  000152                                                             .WORD   L10037-.
                                10$:    CMP     AXNUM,#6        ;SEE IF AX3-15
                                        BNE     3$              ;BR IF NOT
                                        BICB    #AX315U,RAX15   ;MASK OFF UNPREDICTABLE BITS
```

```
5359  024426  123711  002370          3$:     CMPB    RAX15,(R1)      ;COMPARE LO BYTE TO EXPECTED VALUE
5360  024432  001417                          BEQ     4$              ;BR IF DATA MATCHES
5361  024434  005037  002404                  CLR     GOODAT
5362  024440  111137  002404                  MOVB    (R1),GOODAT     ;GET EXPECTED DATA BYTE
5363  024444  013737  002370  002406          MOV     RAX15,BADDAT    ;GET ACTUAL DATA BYTE
5364  024452  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
5365                                  ;REPORT REG NOT INITIALIZED BY MASTER CLEAR
5366  024456                                  ERRDF   2,EM2,ERR3
  (4) 024456  104455                                                                  TRAP    C$ERDF
  (5) 024460  000002                                                                  .WORD   2
  (5) 024462  012163                                                                  .WORD   EM2
  (5) 024464  015142                                                                  .WORD   ERR3
5367  024466                                  ESCAPE  TST
  (3) 024466  104410                                                                  TRAP    C$ESCAPE
  (3) 024470  000070                                                                  .WORD   L10037-.
5368  024472  005237  002402          4$:     INC     AXNUM           ;INCREMENT AX BYTE NO.
5369  024476  005201                          INC     R1              ;INCREMENT PAT POINTER
5370  024500  123711  002372                  CMPB    RAX16,(R1)      ;COMPARE HI BYTE TO EXPECTED VALUE
5371  024504  001417                          BEQ     6$              ;BR IF DATA MATCHES
5372  024506  005037  002404                  CLR     GOODAT
5373  024512  111137  002404                  MOVB    (R1),GOODAT     ;GET EXPECTED DATA BYTE
5374  024516  013737  002372  002406          MOV     RAX16,BADDAT    ;GET ACTUAL DATA BYTE
5375  024524  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
5376                                  ;REPORT REG NOT INITIALIZED BY MASTER CLEAR
5377  024530                                  ERRDF   2,EM2,ERR3
  (4) 024530  104455                                                                  TRAP    C$ERDF
  (5) 024532  000002                                                                  .WORD   2
  (5) 024534  012163                                                                  .WORD   EM2
  (5) 024536  015142                                                                  .WORD   ERR3
5378  024540                                  ESCAPE  TST
  (3) 024540  104410                                                                  TRAP    C$ESCAPE
  (3) 024542  000016                                                                  .WORD   L10037-.
5379  024544  005237  002402          6$:     INC     AXNUM           ;INCR AX BYTE NO.
5380  024550  005201                          INC     R1              ;INCR PAT POINTER
5381  024552  020127  002674                  CMP     R1,#PATJ        ;SEE IF ALL REGS READ YET
5382  024556  103673                          BLO     2$              ;BR IF NOT DONE READING YET
5383  024560                          ENDTST
  (3) 024560                                                                  L10037:
  (3) 024560  104401                                                                  TRAP    C$ETST
5384
5385
5386
5387
5388
5389
5390                                    ;;*****************************************************************************
5391                                    .SBTTL      TEST 15 - EXTENDED REGISTER ADDRESSING TEST
5392                                    ;*
5393                                    ;* FIRST, ISSUE A MASTER CLEAR TO PUT REGS INTO INITIALIZED STATES SHOWN IN
5394                                    ;* PATTERN I. THEN, WRITE A DIFFERENT WORD OF PATTERN J INTO EACH EXTENDED (AX)
5395                                    ;* REG, AND AFTER EACH WRITE, READ AND COMPARE ALL EXTENDED REGS TO EXPECTED
5396                                    ;* VALUES.
5397                                    ;*   PATTERN I = 000,000,000,000,000,103,000,000
5398                                    ;*   PATTERN J = 000,000,010,002,004,103,001,100
5399  024562                            ;;*****************************************************************************
  (3) 024562                            BGNTST
                                                                              T15::
```

```
 5400  024562  004737  003576                    JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
 5401  024566  012701  002664                    MOV     #PATI,R1        ;INIT POINTER TO PAT I
 5402  024572  012702  002500                    MOV     #REDDAT,R2      ;INIT POINTER TO EXPECTED DATA AREA
 5403  024576  112122                    3$:     MOVB    (R1)+,(R2)+     ;MOVE PAT I INTO REDDAT TABLE
 5404  024600  020127  002674                    CMP     R1,#PATJ
 5405  024604  103774                            BLO     3$
 5406  024606  005001                            CLR     R1              ;INIT INDEX FOR WRITING
 5407  024610  010137  002402            6$:     MOV     R1,AXNUM        ;GET AX BYTE NO. FOR WRITING
 5408  024614  116137  002674  002374            MOVB    PATJ(R1),WAX15  ;SET LO AX BYTE TO BE WRITTEN
 5409  024622  116137  002675  002376            MOVB    PATJ+1(R1),WAX16 ;SET HI AX BYTE TO BE WRITTEN
 5410  024630  113761  002374  002500            MOVB    WAX15,REDDAT(R1) ;SET EXPECTED LO BYTE IN TABLE
 5411  024636  113761  002376  002501            MOVB    WAX16,REDDAT+1(R1) ;SET EXPECTED HI BYTE IN TABLE
 5412  024644  004737  004312                    JSR     PC,WRITAX       ;WRITE DATA BYTES INTO EXTENDED REG
 5413  024650  005003                            CLR     R3              ;INIT INDEX FOR READING
 5414  024652  010337  002402            9$:     MOV     R3,AXNUM        ;GET AX BYTE NO. FOR READING
 5415  024656  004737  004124                    JSR     PC,READAX       ;READ 2 AX BYTES
 5416  024662  023727  002402  000006            CMP     AXNUM,#6        ;SEE IF AX3-15
 5417  024670  001003                            BNE     10$             ;BR IF NOT
 5418  024672  142737  000372  002370            BICB    #AX315U,RAX15   ;MASK OFF UNPREDICTABLE BITS
 5419  024700  123763  002370  002500  10$:     CMPB    RAX15,REDDAT(R3) ;COMPARE LO BYTE READ TO EXPECTED
 5420  024706  001420                            BEQ     12$             ;BR IF LO BYTE MATCHES EXPECTED
 5421  024710  005037  002404                    CLR     GOODAT
 5422  024714  116337  002500  002404            MOVB    REDDAT(R3),GOODAT ;GET EXPECTED LO BYTE
 5423  024722  013737  002370  002406            MOV     RAX15,BADDAT    ;GET ACTUAL DATA
 5424  024730  004737  004526                    JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
 5425                                    ;REPORT REG MISCOMPARE
 5426  024734                                    ERRDF   3,EM3,ERR3
   (4) 024734  104455                                                                    TRAP    C$ERDF
   (5) 024736  000003                                                                    .WORD   3
   (5) 024740  012222                                                                    .WORD   EM3
   (5) 024742  015142                                                                    .WORD   ERR3
 5427  024744                                    ESCAPE  TST
   (3) 024744  104410                                                                    TRAP    C$ESCAPE
   (3) 024746  000102                                                                    .WORD   L10040-.
 5428  024750  005237  002402            12$:    INC     AXNUM           ;INCR AX BYTE NO.
 5429  024754  123763  002372  002501            CMPB    RAX16,REDDAT+1(R3) ;COMPARE HI BYTE READ TO EXPECTED
 5430  024762  001420                            BEQ     15$             ;BR IF HI BYTE MATCHES EXPECTED
 5431  024764  005037  002404                    CLR     GOODAT
 5432  024770  116337  002501  002404            MOVB    REDDAT+1(R3),GOODAT ;GET EXPECTED HI BYTE
 5433  024776  013737  002372  002406            MOV     RAX16,BADDAT    ;GET ACTUAL DATA
 5434  025004  004737  004526                    JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
 5435                                    ;REPORT REG MISCOMPARE
 5436  025010                                    ERRDF   3,EM3,ERR3
   (4) 025010  104455                                                                    TRAP    C$ERDF
   (5) 025012  000003                                                                    .WORD   3
   (5) 025014  012222                                                                    .WORD   EM3
   (5) 025016  015142                                                                    .WORD   ERR3
 5437  025020                                    ESCAPE  TST
   (3) 025020  104410                                                                    TRAP    C$ESCAPE
   (3) 025022  000026                                                                    .WORD   L10040-.
 5438  025024  062703  000002            15$:    ADD     #2,R3           ;INCR INDEX FOR READS
 5439  025030  020327  000010                    CMP     R3,#10          ;SEE IF ALL AX BYTES READ YET
 5440  025034  002706                            BLT     9$              ;BR IF NOT DONE READING YET
 5441  025036  062701  000002                    ADD     #2,R1           ;INCR INDEX FOR WRITES
 5442  025042  020127  000010                    CMP     R1,#10          ;SEE IF ALL AX BYTES WRITTEN YET
 5443  025046  002660                            BLT     6$              ;BR IF NOT DONE WRITING YET
```

```
5444  025050                          ENDTST
 (3)  025050                                                                  L10040:
 (3)  025050  104401                                                                  TRAP    C$ETST
5445
5446
5447
5448
5449
5450                                  ;;*************************************************************************************
5451                                  .SBTTL      TEST 16 - REGS 15,16 / AX2-15,AX2-16 READ/WRITE BIT TEST
5452                                  ;*
5453                                  ;* USING REGS 15,16, THE INDIRECT REGS AX2-15,AX2-16 (USYRT REGS 4,5) ARE
5454                                  ;* WRITTEN AND READ USING EACH WORD OF PATTERN K. AX2-15 IS COMPARED
5455                                  ;* TO THE WORD WRITTEN, AND AX2-16 IS ALWAYS COMPARED TO 103. (AX2-16 IS NOT
5456                                  ;* WRITEABLE).
5457                                  ;*    PATTERN K =
5458                                  ;*      FOR REG 15: 000,377,125,252,001,002,004,010,020,040,100,200,000,000,
5459                                  ;*                  000,000,000,000,000,000,376,375,373,367,357,337,277,177,
5460                                  ;*                  377,377,377,377,377,377,377,377
5461                                  ;*      FOR REG 16: 000,377,125,252,000,000,000,000,000,000,000,000,001,002,
5462                                  ;*                  004,010,020,040,100,200,377,377,377,377,377,377,377,377,
5463                                  ;*                  376,375,373,367,357,337,277,177.
5464                                  ;;*************************************************************************************
5465  025052                          BGNTST
 (3)  025052                                                                  T16::
5466  025052  004737  003576                  JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
5467  025056  012701  002704                  MOV     #PATK,R1        ;INIT DATA PATTERN POINTER
5468  025062                          3$:
5469  025062                                  BGNSEG
 (3)  025062  104404                                                                  TRAP    C$BSEG
5470  025064  012737  000004  002402          MOV     #4,AXNUM        ;SET BYTE NO. = 4
5471  025072  111137  002374                  MOVB    (R1),WAX15      ;SET DATA TO WRITE INTO LO BYTE
5472  025076  116137  000001  002376          MOVB    1(R1),WAX16     ;SET DATA TO WRITE INTO HI BYTE
5473  025104  143737  002565  002374          BICB    ANBITS+4,WAX15  ;MASK OFF NON-READ/WRITE BITS IN LO BYTE
5474  025112  143737  002566  002376          BICB    ANBITS+5,WAX16  ;MASK OFF NON-READ/WRITE BITS IN HI BYTE
5475  025120  004737  004312                  JSR     PC,WRITAX       ;LOAD DATA INTO AX2-15,AX2-16
5476  025124  004737  004124                  JSR     PC,READAX       ;READ AX2-15 AND AX2-16
5477  025130  123737  002370  002374          CMPB    RAX15,WAX15     ;COMPARE LO BYTE DATA READ
5478  025136  001416                          BEQ     6$              ;BR IF DATA MATCHES
5479  025140  013737  002374  002404          MOV     WAX15,GOODAT    ;SET EXPECTED DATA
5480  025146  013737  002370  002406          MOV     RAX15,BADDAT    ;SET ACTUAL DATA
5481  025154  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
5482                                  ;REPORT REG MISCOMPARE
5483  025160                                  ERRDF   3,EM3,ERR3
 (4)  025160  104455                                                                  TRAP    C$ERDF
 (5)  025162  000003                                                                  .WORD   3
 (5)  025164  012222                                                                  .WORD   EM3
 (5)  025166  015142                                                                  .WORD   ERR3
5484  025170                                  ESCAPE  SEG
 (3)  025170  104410                                                                  TRAP    C$ESCAPE
 (3)  025172  000052                                                                  .WORD   10000$-.
5485  025174  005237  002402          6$:     INC     AXNUM           ;SET AX BYTE NO. = 5
5486  025200  123737  002372  002671          CMPB    RAX16,PATI+5    ;COMPARE HI BYTE DATA READ
5487  025206  001416                          BEQ     9$              ;BR IF DATA MATCHES
5488  025210  005037  002404                  CLR     GOODAT
5489  025214  113737  002671  002404          MOVB    PATI+5,GOODAT   ;SET EXPECTED DATA
```

```
                        002372  002406          MOV     RAX16,BADDAT    ;SET ACTUAL DATA
                        004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                                              ;REPORT REG MISCOMPARE
                                                ERRDF   3,EM3,ERR3
(4)  025234  104455                                                             TRAP    C$ERDF
(5)  025236  000003                                                             .WORD   3
(5)  025240  012222                                                             .WORD   EM3
(5)  025242  015142                                                             .WORD   ERR3
                                              9$:
                                                ENDSEG
(3)  025244                                                                 10000$:
(3)  025244  104405                                                             TRAP    C$ESEG
                        000002                  ADD     #2,R1           ;INCR PATTERN POINTER
                        003014                  CMP     R1,#PATL        ;SEE IF ALL DATA WRITTEN YET
                                                BLO     3$              ;BR IF NOT DONE YET
                                              ENDTST
(3)  025260                                                                 L10041:
(3)  025260  104401                                                             TRAP    C$ETST


                                              ;;*****************************************************************************
                                              .SBTTL      TEST 17 - AX0-15,AX0-16 READ/WRITE BIT TEST
                                              ;*
                                              ;* IN THIS TEST, A MASTER CLEAR IS DONE, AND THEN A WRITE, READ, AND COMPARE
                                              ;* ARE PERFORMED IN REGS AX0-15,AX0-16 USING EACH WORD OF PATTERN L.
                                              ;* ANY BITS IN AX0-15,AX0-16 WHICH ARE NOT READ/WRITE ARE MASKED OFF (TO 0)
                                              ;* IN THE EXPECTED VALUE BEFORE COMPARISON.
                                              ;*    PATTERN L =
                                              ;*      FOR REG 15: 000,377,000
                                              ;*      FOR REG 16: 000,377,000.
                                              ;;*****************************************************************************
                                              BGNTST
(3)  025262                                                                 T17::
                        004737  003576          JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
                        012701  003014          MOV     #PATL,R1        ;INIT DATA PATTERN POINTER
                                              3$:
                                                BGNSEG
(3)  025272  104404                                                             TRAP    C$BSEG
                        000000  002402          MOV     #0,AXNUM        ;SET BYTE NO. = 0
                        002374                  MOVB    (R1),WAX15      ;SET DATA TO WRITE INTO LO BYTE
                        000001  002376          MOVB    1(R1),WAX16     ;SET DATA TO WRITE INTO HI BYTE
                        002561  002374          BICB    ANBITS+0,WAX15  ;MASK OFF NON-READ/WRITE BITS IN LO BYTE
                        002562  002376          BICB    ANBITS+1,WAX16  ;MASK OFF NON-READ/WRITE BITS IN HI BYTE
                        004312                  JSR     PC,WRITAX       ;LOAD DATA INTO AX0-15,AX0-16
                        004124                  JSR     PC,READAX       ;READ AX0-15 AND AX0-16
                        002370  002374          CMPB    RAX15,WAX15     ;COMPARE LO BYTE DATA READ
                                                BEQ     6$              ;BR IF DATA MATCHES
                        002374  002404          MOV     WAX15,GOODAT    ;SET EXPECTED DATA
                        002370  002406          MOV     RAX15,BADDAT    ;SET ACTUAL DATA
                        004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                                              ;REPORT REG MISCOMPARE
                                                ERRDF   3,EM3,ERR3
(4)  025370  104455                                                             TRAP    C$ERDF
```

```
  (5)  025372  000003                                                                    .WORD   3
  (5)  025374  012222                                                                    .WORD   EM3
  (5)  025376  015142                                                                    .WORD   ERR3
5535   025400                          ESCAPE  SEG
  (3)  025400  104410                                                                    TRAP    C$ESCAPE
  (3)  025402  000046                                                                    .WORD   10000$-.
5536   025404  005237  002402          6$:     INC     AXNUM           ;SET AX BYTE NO. = 1
5537   025410  123737  002372  002376          CMPB    RAX16,WAX16     ;COMPARE HI BYTE DATA READ
5538   025416  001414                          BEQ     9$              ;BR IF DATA MATCHES
5539   025420  013737  002376  002404          MOV     WAX16,GOODAT    ;SET EXPECTED DATA
5540   025426  013737  002372  002406          MOV     RAX16,BADDAT    ;SET ACTUAL DATA
5541   025434  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
5542                          ;REPORT REG MISCOMPARE
5543   025440                  ERRDF   3,EM3,ERR3
  (4)  025440  104455                                                                    TRAP    C$ERDF
  (5)  025442  000003                                                                    .WORD   3
  (5)  025444  012222                                                                    .WORD   EM3
  (5)  025446  015142                                                                    .WORD   ERR3
5544   025450                  9$:
5545   025450                  ENDSEG
  (3)  025450                                                                    10000$:
  (3)  025450  104405                                                                    TRAP    C$ESEG
5546   025452  062701  000002          ADD     #2,R1           ;INCR PATTERN POINTER
5547   025456  020127  003022          CMP     R1,#PATM        ;SEE IF ALL DATA WRITTEN YET
5548   025462  103703                  BLO     3$              ;BR IF NOT DONE YET
5549   025464                  ENDTST
  (3)  025464                                                                    L10042:
  (3)  025464  104401                                                                    TRAP    C$ETST
5550
5551
5552
5553
5554
5555                          ;;*******************************************************************************
5556                          .SBTTL      TEST 18 - AX1-15,AX1-16 READ/WRITE BIT TEST
5557                          ;*
5558                          ;* IN THIS TEST, A MASTER CLEAR IS DONE, AND THEN A WRITE, READ, AND COMPARE
5559                          ;* ARE PERFORMED IN REGS AX1-15,AX1-16 USING EACH WORD OF PATTERN K.
5560                          ;* ANY BITS IN AX1-15,AX1-16 WHICH ARE NOT READ/WRITE ARE MASKED OFF (TO 0)
5561                          ;* IN THE EXPECTED VALUE BEFORE COMPARISON.
5562                          ;;*******************************************************************************
5563   025466                 BGNTST
  (3)  025466                                                                    T18::
5564   025466  004737  003576          JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
5565   025472  012701  002704          MOV     #PATK,R1        ;INIT DATA PATTERN POINTER
5566   025476                 3$:
5567   025476                  BGNSEG
  (3)  025476  104404                                                                    TRAP    C$BSEG
5568   025500  012737  000002  002402          MOV     #2,AXNUM        ;SET BYTE NO. = 2
5569   025506  111137  002374                  MOVB    (R1),WAX15      ;SET DATA TO WRITE INTO LO BYTE
5570   025512  116137  000001  002376          MOVB    1(R1),WAX16     ;SET DATA TO WRITE INTO HI BYTE
5571   025520  143737  002563  002374          BICB    ANBITS+2,WAX15  ;MASK OFF NON-READ/WRITE BITS IN LO BYTE
5572   025526  143737  002564  002376          BICB    ANBITS+3,WAX16  ;MASK OFF NON-READ/WRITE BITS IN HI BYTE
5573   025534  004737  004312                  JSR     PC,WRITAX       ;LOAD DATA INTO AX1-15,AX1-16
5574   025540  004737  004124                  JSR     PC,READAX       ;READ AX1-15 AND AX1-16
5575   025544  123737  002370  002374          CMPB    RAX15,WAX15     ;COMPARE LO BYTE DATA READ
```

```
5576  025552  001416                          BEQ     6$              ;BR IF DATA MATCHES
5577  025554  013737  002374  002404          MOV     WAX15,GOODAT    ;SET EXPECTED DATA
5578  025562  013737  002370  002406          MOV     RAX15,BADDAT    ;SET ACTUAL DATA
5579  025570  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
5580                                  ;REPORT REG MISCOMPARE
5581  025574                                  ERRDF   3,EM3,ERR3
 (4)  025574  104455                                                            TRAP    C$ERDF
 (5)  025576  000003                                                            .WORD   3
 (5)  025600  012222                                                            .WORD   EM3
 (5)  025602  015142                                                            .WORD   ERR3
5582  025604                          ESCAPE  SEG
 (3)  025604  104410                                                            TRAP    C$ESCAPE
 (3)  025606  000046                                                            .WORD   10000$-.
5583  025610  005237  002402          6$:     INC     AXNUM           ;SET AX BYTE NO. = 3
5584  025614  123737  002372  002376          CMPB    RAX16,WAX16     ;COMPARE HI BYTE DATA READ
5585  025622  001414                          BEQ     9$              ;BR IF DATA MATCHES
5586  025624  013737  002376  002404          MOV     WAX16,GOODAT    ;SET EXPECTED DATA
5587  025632  013737  002372  002406          MOV     RAX16,BADDAT    ;SET ACTUAL DATA
5588  025640  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
5589                                  ;REPORT REG MISCOMPARE
5590  025644                                  ERRDF   3,EM3,ERR3
 (4)  025644  104455                                                            TRAP    C$ERDF
 (5)  025646  000003                                                            .WORD   3
 (5)  025650  012222                                                            .WORD   EM3
 (5)  025652  015142                                                            .WORD   ERR3
5591  025654                          9$:
5592  025654                          ENDSEG
 (3)  025654                                                            10000$:
 (3)  025654  104405                                                            TRAP    C$ESEG
5593  025656  062701  000002                  ADD     #2,R1           ;INCR PATTERN POINTER
5594  025662  020127  003014                  CMP     R1,#PATL        ;SEE IF ALL DATA WRITTEN YET
5595  025666  103703                          BLO     3$              ;BR IF NOT DONE YET
5596  025670                          ENDTST
 (3)  025670                                                            L10043:
 (3)  025670  104401                                                            TRAP    C$ETST
5597
5598
5599
5600
5601
5602                                    ;;*****************************************************************************
5603                                    .SBTTL      TEST 19 - AX3-15,AX3-16 READ/WRITE BIT TEST
5604                                    ;*
5605                                    ;* IN THIS TEST A MASTER CLEAR IS DONE AND THEN A WRITE, READ, AND COMPARE ARE
5606                                    ;* PERFORMED IN REGS AX3-15,AX3-16 USING EACH WORD OF PATTERN V FOR WRITING,
5607                                    ;* AND PATTERN U FOR COMPARING.
5608                                    ;* ANY BITS IN AX3-15,AX3-16 WHICH ARE NOT READ/WRITE ARE MASKED OFF (TO 0)
5609                                    ;* IN THE EXPECTED VALUE BEFORE COMPARISON.
5610                                    ;*   PATTERN V =
5611                                    ;*      FOR REG 15 : 000,333,331,323,313,233,133,000,000,000,000,
5612                                    ;*                   000,000,000,000,000,000,000,000
5613                                    ;*      FOR REG 16 : 000,000,000,000,000,000,000,001,002,004,040,
5614                                    ;*                   100,200,346,345,343,307,247,147
5615                                    ;*   PATTERN U =
5616                                    ;*      FOR REG 15 : 000,001,013,011,021,101,301,000,000,000,000,
5617                                    ;*                   000,000,000,000,000,000,000,000
```

```
                        ;*      FOR REG 16 : 000,000,000,000,000,000,000,001,002,004,040,
                        ;*                   100,200,346,345,343,307,247,147
                        ;;*************************************************************************************
                        BGNTST
                                                                                        T19::
5622 025672 004737 003576       JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
5623 025676 142777 000010 154544 BICB   #LULOOP,@BSEL1  ;CLEAR LULOOP
5624 025704 012702 003152       MOV     #PATV,R2        ;INIT PATTERN V POINTER
5625 025710 012701 003104       MOV     #PATU,R1        ;INIT PATTERN U POINTER
                        3$:
5627 025714                     BGNSEG
(3)  025714 104404                                                      TRAP    C$BSEG
5628 025716 012737 000006 002402 MOV    #6,AXNUM        ;SET BYTE NO. = 6
5629 025724 111237 002374       MOVB    (R2),WAX15      ;SET DATA TO WRITE INTO LO BYTE
5630 025730 116237 000001 002376 MOVB   1(R2),WAX16     ;SET DATA TO WRITE INTO HI BYTE
5631 025736 004737 004312       JSR     PC,WRITAX       ;LOAD DATA INTO AX3-15,AX3-16
5632 025742 004737 004124       JSR     PC,READAX       ;READ AX3-15 AND AX3-16
5633 025746 132737 000001 002374 BITB   #TEST,WAX15     ;SEE IF AN INTERFACE IS SELECTED
5634 025754 001003              BNE     4$              ;BR IF YES
5635 025756 142737 000372 002370 BICB   #AX315U,RAX15   ;MASK OFF UNPREDICTABLE BITS
5636 025764 142737 000040 002370 4$:    BICB    #C32BCC,RAX15   ;CLEAR CRC32 BCC BIT
5637 025772 123711 002370       CMPB    RAX15,(R1)      ;COMPARE LO BYTE DATA READ
5638 025776 001417              BEQ     6$              ;BR IF DATA MATCHES
5639 026000 005037 002404       CLR     GOODAT
5640 026004 111137 002404       MOVB    (R1),GOODAT     ;SET EXPECTED DATA
5641 026010 013737 002370 002406 MOV    RAX15,BADDAT    ;SET ACTUAL DATA
5642 026016 004737 004526       JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                        ;REPORT REG MISCOMPARE
5644 026022                     ERRDF   3,EM3,ERR3
(4)  026022 104455                                                      TRAP    C$ERDF
(5)  026024 000003                                                      .WORD   3
(5)  026026 012222                                                      .WORD   EM3
(5)  026030 015142                                                      .WORD   ERR3
5645 026032                     ESCAPE  SEG
(3)  026032 104410                                                      TRAP    C$ESCAPE
(3)  026034 000052                                                      .WORD   10000$-.
5646 026036 005237 002402       6$:     INC     AXNUM           ;SET AX BYTE NO. = 7
5647 026042 123761 002372 000001 CMPB   RAX16,1(R1)     ;COMPARE HI BYTE DATA READ
5648 026050 001416              BEQ     9$              ;BR IF DATA MATCHES
5649 026052 005037 002404       CLR     GOODAT
5650 026056 116137 000001 002404 MOVB   1(R1),GOODAT    ;SET EXPECTED DATA
5651 026064 013737 002372 002406 MOV    RAX16,BADDAT    ;SET ACTUAL DATA
5652 026072 004737 004526       JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                        ;REPORT REG MISCOMPARE
5654 026076                     ERRDF   3,EM3,ERR3
(4)  026076 104455                                                      TRAP    C$ERDF
(5)  026100 000003                                                      .WORD   3
(5)  026102 012222                                                      .WORD   EM3
(5)  026104 015142                                                      .WORD   ERR3
                        9$:
5656 026106                     ENDSEG
(3)  026106                                                     10000$:
(3)  026106 104405                                                      TRAP    C$ESEG
5657 026110 062702 000002       ADD     #2,R2           ;INCR PATTERN V POINTER
5658 026114 062701 000002       ADD     #2,R1           ;INCR PATTERN U POINTER
5659 026120 020127 003152       CMP     R1,#PATV        ;SEE IF ALL DATA WRITTEN YET
```

```
 5660  026124  103673                    BLO     3$              ;BR IF NOT DONE YET
 5661  026126                          ENDTST
  (3)  026126                                                                  L10044:
  (3)  026126  104401                                                                 TRAP    C$ETST
 5662
 5663
 5664
 5665
 5666
 5667                                  ;;*************************************************************************
 5668                                  .SBTTL      TEST 20 - REG 17 - AX2-16 READ/WRITE, MASTER CLEAR TEST
 5669                                  ;*
 5670                                  ;* THIS TEST CONSISTS OF 2 SUBTESTS. IN THE FIRST SUBTEST, EACH BYTE OF PAT O
 5671                                  ;* IS WRITTEN INTO REG 17 AND AFTER EACH WRITE, AX2-16 IS READ AND COMPARED
 5672                                  ;* TO A BYTE OF PAT P.
 5673                                  ;*   PATTERN O = 000,041,004,010,020,040,100,101,200,201,300,111,301,375
 5674                                  ;*   PATTERN P = 000,113,200,040,020,010,001,104,007,105,007,144,107,157
 5675                                  ;* IN THE SECOND SUBTEST, REG 17 IS LOADED WITH 375, A MASTER CLEAR IS ISSUED,
 5676                                  ;* AND AX2-16 IS COMPARED TO ITS INITIALIZED STATE (103).
 5677                                  ;;*************************************************************************
 5678  026130                          BGNTST
  (3)  026130                                                                  T20::
 5679  026130  004737  003576                JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
 5680  026134  012701  003050                MOV     #PATO,R1        ;INIT PAT O POINTER
 5681  026140  012702  003066                MOV     #PATP,R2        ;INIT PAT P POINTER
 5682  026144  012737  000017  002400        MOV     #17,REGNUM      ;SET LU REG NO. = 17
 5683  026152  012737  000005  002402        MOV     #5,AXNUM        ;SET AX BYTE NO. = 5 FOR AX2-16
 5684                                  ;-------------------------------------------------------------------------
 5685                                  ; WRITE REG 17, READ AND COMPARE AX2-16
 5686                                  ;-------------------------------------------------------------------------
 5687  026160                                BGNSUB
  (3)  026160                                                                  T20.1:
  (3)  026160  104402                                                                 TRAP    C$BSUB
 5688  026162                          3$:
 5689  026162                                BGNSEG
  (3)  026162  104404                                                                 TRAP    C$BSEG
 5690  026164  111137  002366                MOVB    (R1),WRIBYT     ;SET BYTE TO BE WRITTEN
 5691  026170  004737  003750                JSR     PC,WRITLU       ;WRITE DATA BYTE INTO REG 17
 5692  026174  004737  004124                JSR     PC,READAX       ;READ AX2
 5693  026200  123712  002372                CMPB    RAX16,(R2)      ;COMPARE AX2-16 TO EXPECTED DATA
 5694  026204  001421                        BEQ     6$              ;BR IF DATA MATCHES
 5695  026206  005037  002410                CLR     LOADAT
 5696  026212  111137  002410                MOVB    (R1),LOADAT     ;SET DATA WHICH WAS WRITTEN
 5697  026216  005037  002404                CLR     GOODAT
 5698  026222  111237  002404                MOVB    (R2),GOODAT     ;SET EXPECTED DATA READ
 5699  026226  013737  002372  002406        MOV     RAX16,BADDAT    ;SET ACTUAL DATA READ
 5700  026234  004737  004526                JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
 5701                                  ;REPORT REG MISCOMPARE
 5702  026240                                ERRDF   3,EM3,ERR5
  (4)  026240  104455                                                                 TRAP    C$ERDF
  (5)  026242  000003                                                                 .WORD   3
  (5)  026244  012222                                                                 .WORD   EM3
  (5)  026246  016302                                                                 .WORD   ERR5
 5703  026250                          6$:
 5704  026250                                ENDSEG
  (3)  026250                                                                  10000$:
```

```
  (3)  026250  104405                                                                    TRAP    C$ESEG
5705   026252  005201                    INC     R1              ;INCR PAT O POINTER
5706   026254  005202                    INC     R2              ;INCR PAT P POINTER
5707   026256  020127  003066            CMP     R1,#PATP        ;SEE IF ALL BYTES LOADED YET
5708   026262  103737                    BLO     3$              ;BR IF NOT
5709   026264                            ENDSUB
  (3)  026264                                                                    L10046:
  (3)  026264  104403                                                                    TRAP    C$ESUB
5710                              ;-------------------------------------------------------------------------------
5711                              ; LOAD REG 17, DO MASTER CLEAR, READ AND COMPARE AX2-16
5712                              ;-------------------------------------------------------------------------------
5713   026266                            BGNSUB
  (3)  026266                                                                    T20.2:
  (3)  026266  104402                                                                    TRAP    C$BSUB
5714   026270  112737  000375  002366    MOVB    #375,WRIBYT     ;SET DATA TO BE LOADED
5715   026276  004737  003750            JSR     PC,WRITLU       ;LOAD DATA INTO REG 17
5716   026302  004737  003576            JSR     PC,MSTCLR       ;PERFORM MASTER CLEAR
5717   026306  004737  004124            JSR     PC,READAX       ;READ AX2-15,AX2-16
5718   026312  123737  002372  002671    CMPB    RAX16,PATI+5    ;SEE IF AX2-16 WAS INIT'D CORRECTLY
5719   026320  001416                    BEQ     6$              ;BR IF YES
5720   026322  005037  002404            CLR     GOODAT
5721   026326  113737  002671  002404    MOVB    PATI+5,GOODAT   ;SET EXPECTED DATA
5722   026334  013737  002372  002406    MOV     RAX16,BADDAT    ;SET ACTUAL DATA
5723   026342  004737  004526            JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
5724                              ;REPORT REG NOT INITIALIZED BY MASTER CLEAR
5725   026346                            ERRDF   2,EM2,ERR3
  (4)  026346  104455                                                                    TRAP    C$ERDF
  (5)  026350  000002                                                                    .WORD   2
  (5)  026352  012163                                                                    .WORD   EM2
  (5)  026354  015142                                                                    .WORD   ERR3
5726   026356                     6$:
5727   026356                            ENDSUB
  (3)  026356                                                                    L10047:
  (3)  026356  104403                                                                    TRAP    C$ESUB
5728   026360                     ENDTST
  (3)  026360                                                                    L10045:
  (3)  026360  104401                                                                    TRAP    C$ETST
5729
5730
5731
5732
5733
5734                              ;;*************************************************************************************
5735                              .SBTTL      TEST 21 - TRANSMITTER BUFFER DATA TEST
5736                              ;* A MASTER CLEAR IS DONE FIRST, AND THEN A BYTE OF PATTERN N IS LOADED INTO
5737                              ;* REG 11 AND THE NEXT BYTE IS LOADED TWICE INTO REG 10. THE PROGRAM THEN WAITS
5738                              ;* AT LEAST 50 MICRO-SEC, AND THEN IT READS AND COMPARES AX1-15 TO THE BYTE
5739                              ;* WHICH WAS LOADED INTO REG 10, AND IT READS AND COMPARES AX1-16 TO THE BYTE
5740                              ;* WHICH WAS LOADED INTO REG 11. THIS PROCESS IS REPEATED (INCLUDING THE MASTER
5741                              ;* CLEAR) FOR EACH PAIR OF BYTES IN PATTERN N.
5742                              ;*   PATTERN N =
5743                              ;*     FOR REG 10: 000,125,252,377,000,000,000
5744                              ;*     FOR REG 11: 000,000,000,000,005,012,017
5745                              ;;*************************************************************************************
5746   026362                     BGNTST
  (3)  026362                                                                    T21::
```

```
 5747  026362  012701  003032                MOV     #PATN,R1        ;INIT PATTERN POINTER
 5748  026366  012737  026630  002362        MOV     #A2,RETADR      ;SET SUBROUTINE ERROR RETURN ADDRESS
 5749  026374                                BGNSUB
   (3) 026374                                                                T21.1:
   (3) 026374  104402                                                            TRAP    C$BSUB
 5750  026376  004737  003576          3$:   JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
 5751  026402  004737  004662                JSR     PC,OSIRDY       ;CHECK ORDY AND OCOR FOR EXPECTED STATES
 5752  026406  000001                        1
 5753  026410  012737  000011  002400        MOV     #11,REGNUM      ;SET LU REG NO. = 11
 5754  026416  111137  002366                MOVB    (R1),WRIBYT     ;SET DATA BYTE TO BE WRITTEN
 5755  026422  004737  003750                JSR     PC,WRITLU       ;WRITE BYTE INTO REG 11
 5756  026426  012737  000010  002400        MOV     #10,REGNUM      ;SET LU REG NO. = 10
 5757  026434  116137  000001  002366        MOVB    1(R1),WRIBYT    ;SET DATA BYTE TO BE WRITTEN
 5758  026442  004737  003750                JSR     PC,WRITLU       ;WRITE BYTE INTO REG 10
 5759  026446  004737  003750                JSR     PC,WRITLU       ;WRITE IT AGAIN (SO 2 ENTRIES ARE IN SILO)
 5760  026452  004737  005146                JSR     PC,WAIT50       ;WAIT FOR SILO DATA TO RIPPLE
 5761  026456  004737  004662                JSR     PC,OSIRDY       ;CHECK ORDY AND OCOR FOR EXPECTED STATES
 5762  026462  000003                        3
 5763  026464  012737  000002  002402        MOV     #2,AXNUM        ;SET BYTE NO. FOR AX1-15
 5764  026472  004737  004124                JSR     PC,READAX       ;READ AX1-15, AX1-16
 5765  026476  123761  002370  000001        CMPB    RAX15,1(R1)     ;COMPARE AX1-15 TO EXPECTED
 5766  026504  001420                        BEQ     6$              ;BR IF MATCH
 5767  026506  005037  002404                CLR     GOODAT
 5768  026512  116137  000001  002404        MOVB    1(R1),GOODAT    ;SET EXPECTED DATA
 5769  026520  013737  002370  002406        MOV     RAX15,BADDAT    ;SET ACTUAL DATA
 5770  026526  004737  004526                JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
 5771                            ;REPORT REG MISCOMPARE
 5772  026532                                ERRDF   3,EM3,ERR3
   (4) 026532  104455                                                        TRAP    C$ERDF
   (5) 026534  000003                                                        .WORD   3
   (5) 026536  012222                                                        .WORD   EM3
   (5) 026540  015142                                                        .WORD   ERR3
 5773  026542                                ESCAPE  SUB
   (3) 026542  104410                                                        TRAP    C$ESCAPE
   (3) 026544  000064                                                        .WORD   L10051-.
 5774  026546  005237  002402          6$:   INC     AXNUM           ;INCR AX BYTE NO.
 5775  026552  123711  002372                CMPB    RAX16,(R1)      ;COMPARE AX1-16 TO EXPECTED
 5776  026556  001417                        BEQ     9$              ;BR IF MATCH
 5777  026560  005037  002404                CLR     GOODAT
 5778  026564  111137  002404                MOVB    (R1),GOODAT     ;SET EXPECTED DATA
 5779  026570  013737  002372  002406        MOV     RAX16,BADDAT    ;SET ACTUAL DATA
 5780  026576  004737  004526                JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
 5781                            ;REPORT REG MISCOMPARE
 5782  026602                                ERRDF   3,EM3,ERR3
   (4) 026602  104455                                                        TRAP    C$ERDF
   (5) 026604  000003                                                        .WORD   3
   (5) 026606  012222                                                        .WORD   EM3
   (5) 026610  015142                                                        .WORD   ERR3
 5783  026612                                ESCAPE  SUB
   (3) 026612  104410                                                        TRAP    C$ESCAPE
   (3) 026614  000014                                                        .WORD   L10051-.
 5784  026616  062701  000002          9$:   ADD     #2,R1           ;INCR DATA PATTERN POINTER
 5785  026622  020127  003050                CMP     R1,#PATO        ;SEE IF ALL DATA BYTES WRITTEN YET
 5786  026626  103663                        BLO     3$              ;BR IF NOT DONE YET
 5787  026630                          A2:
 5788  026630                                ENDSUB
```

```
  (3)  026630                                                                    L10051:
  (3)  026630  104403                                                                  TRAP    C$ESUB
5789   026632                        ENDTST
  (3)  026632                                                                    L10050:
  (3)  026632  104401                                                                  TRAP    C$ETST
5790
5791
5792
5793
5794
5795                                ;;*************************************************************************************
5796                                .SBTTL      TEST 22 - TRANSMITTER BUFFER SEQUENCING TEST
5797                                ;*
5798                                ;* FIRST, A MASTER CLEAR IS DONE, AND THE PROGRAM CHECKS FOR ORDY=1, OCOR=0.
5799                                ;* THEN, 2 TSOM CHARS ARE LOADED INTO THE TX SILO, AND ALLOWED TO RIPPLE
5800                                ;* DOWN TO THE OUTPUT. THE PROGRAM CHECKS FOR ORDY=1, OCOR=1.
5801                                ;* NEXT, THE PROGRAM CYCLES THE STEPLU BIT UNTIL OCOR=0 AGAIN, AND CHECKS FOR
5802                                ;* THIS TO OCCUR WITHIN 3 CYCLES.
5803                                ;* THE SILO IS THEN FILLED WITH 64 BYTES OF A 256-BYTE BINARY COUNT PATTERN
5804                                ;* (000-377) AND THE PROGRAM CHECKS FOR ORDY=0 AFTER THE 64TH CHAR IS LOADED.
5805                                ;* THE PROGRAM CYCLES STEPLU FOR 8 CYCLES AND CHECKS THAT AFTER THE 8TH, ORDY=1.
5806                                ;* AX1-15 IS READ AND COMPARED TO EXPECTED DATA.
5807                                ;* THE REST OF THE BINARY COUNT DATA BYTES ARE LOADED, CYCLED 8 CLOCKS, READ AND
5808                                ;* COMPARED, A BYTE AT A TIME. UPON COMPLETION, THE SILO IS CHECKED TO BE EMPTY
5809                                ;* WITH ORDY=1, OCOR=0.
5810                                ;*************************************************************************************
5811   026634                       BGNTST
  (3)  026634                                                                    T22::
5812   026634  012737  027310  002362          MOV     #A3,RETADR      ;SET SUBR ERROR RETURN ADDR
5813                               ;-------------------------------------------------------------------------------
5814                               ; SET MASTER CLEAR, CHECK FOR ORDY=1, OCOR=0
5815                               ;-------------------------------------------------------------------------------
5816   026642  004737  003576          JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
5817   026646  004737  004662          JSR     PC,OSIRDY       ;CHK ORDY=1, OCOR=0
5818   026652  000001                  1
5819                               ;-------------------------------------------------------------------------------
5820                               ; LOAD 2 SOM CHARS, ALLOW SILO TO RIPPLE, CHK ORDY=1, OCOR=1
5821                               ;-------------------------------------------------------------------------------
5822   026654  012737  000400  002422          MOV     #TXSOM,TXWORD   ;SET DATA TO WRITE INTO SILO
5823   026662  004737  005174          JSR     PC,LDTXSI       ;LOAD THE SILO WITH SOM
5824   026666  004737  005174          JSR     PC,LDTXSI       ;LOAD ANOTHER SOM
5825   026672  004737  005146          JSR     PC,WAIT50       ;WAIT FOR DATA TO RIPPLE
5826   026676  004737  004662          JSR     PC,OSIRDY       ;CHK ORDY=1, OCOR=1
5827   026702  000003                  3
5828
5829                               ;-------------------------------------------------------------------------------
5830                               ; CLOCK LINE UNIT, CHK FOR OCOR = 0 WITHIN 3 CYCLES
5831   026704  005001                ;-------------------------------------------------------------------------------
5832   026706  012737  000017  002400          CLR     R1              ;INIT CYCLE COUNTER TO 0
5833   026714  004737  005254          MOV     #17,REGNUM      ;SET REG NO. = 17
5834   026720  000001          3$:     JSR     PC,STPLU        ;STEP LU 1 CYCLE
5835   026722  004737  003672                  1
5836   026726  132737  000020  002364          JSR     PC,READLU       ;READ REG 17
5837   026734  001404                  BITB    #OCOR,REDBYT    ;SEE IF OCOR = 0 YET
5838   026736  005201                  BEQ     6$              ;BR IF OCOR = 0
5839   026740  020127  000003          INC     R1              ;INCR CYCLE COUNT
                                       CMP     R1,#3           ;SEE IF 3 CYCLES DONE YET
```

```
5840  026744  002763                          BLT     3$                ;BR IF NO
5841  026746  004737  004662          6$:     JSR     PC,OSIRDY         ;CHK ORDY=1, OCOR=0
5842  026752  000001                          1
5843                                  ;-----------------------------------------------------------------------
5844                                  ; LOAD 64 BINARY COUNT CHARS INTO SILO, CHK ORDY=0
5845                                  ;-----------------------------------------------------------------------
5846  026754  005003                          CLR     R3                ;INIT PATTERN FOR WRITING
5847  026756  010337  002422          8$:     MOV     R3,TXWORD         ;SET DATA TO BE WRITTEN
5848  026762  004737  005174                  JSR     PC,LDTXSI         ;LOAD DATA CHAR INTO TX SILO
5849  026766  004737  005146                  JSR     PC,WAIT50         ;WAIT FOR DATA TO RIPPLE IN SILO
5850  026772  020327  000077                  CMP     R3,#63.           ;SEE IF 64TH CHAR JUST LOADED
5851  026776  001004                          BNE     9$                ;BR IF NO
5852  027000  012737  000002  027022          MOV     #2,14$            ;SET UP TO CHK ORDY=0,OCOR=1
5853  027006  000403                          BR      12$
5854  027010  012737  000003  027022  9$:     MOV     #3,14$            ;SET UP TO CHK ORDY=1,OCOR=1
5855  027016  004737  004662          12$:    JSR     PC,OSIRDY         ;CHK ORDY, OCOR
5856  027022  000000                  14$:    .WORD   0
5857  027024  005203                          INC     R3                ;INCR PATTERN FOR WRITES
5858  027026  020327  000100                  CMP     R3,#64.           ;SEE IF 64 CHARS LOADED YET
5859  027032  002751                          BLT     8$                ;BR IF NO
5860                                  ;-----------------------------------------------------------------------
5861                                  ; CLOCK LINE UNIT, CHECK ORDY = 1 WITHIN 8 CYCLES
5862                                  ;-----------------------------------------------------------------------
5863  027034  012737  000011  002400          MOV     #11,REGNUM        ;SET REG NO. = 11
5864  027042  005001                          CLR     R1                ;INIT CYCLE COUNT
5865  027044  004737  005254          16$:    JSR     PC,STPLU          ;CLOCK LU FOR 1 CYCLE
5866  027050  000001                          1
5867  027052  004737  003672                  JSR     PC,READLU         ;READ REG 11
5868  027056  132737  000020  002364          BITB    #ORDY,REDBYT      ;SEE IF ORDY = 1 YET
5869  027064  001004                          BNE     19$               ;BR IF YES
5870  027066  005201                          INC     R1                ;INCR CYCLE COUNT
5871  027070  020127  000010                  CMP     R1,#8.            ;SEE IF 8 CYCLES YET
5872  027074  002763                          BLT     16$               ;BR IF NOT YET
5873  027076  004737  004662          19$:    JSR     PC,OSIRDY         ;CHK ORDY = ', OCOR = 1
5874  027102  000003                          3
5875                                  ;-----------------------------------------------------------------------
5876                                  ; READ AND COMPARE FIRST CHARACTER IN AX1-15
5877                                  ;-----------------------------------------------------------------------
5878  027104  005004                          CLR     R4                ;INIT PATTERN FOR READING
5879  027106  012737  000002  002402          MOV     #2,AXNUM          ;SET AX BYTE NO. FOR AX1-15
5880  027114  004737  004124                  JSR     PC,READAX         ;READ AX1-15
5881  027120  123704  002370                  CMPB    RAX15,R4          ;COMPARE AX1-15 TO EXPECTED
5882  027124  001415                          BEQ     20$               ;BR IF MATCH
5883  027126  010437  002404                  MOV     R4,GOODAT         ;SET EXPECTED DATA
5884  027132  013737  002370  002406          MOV     RAX15,BADDAT      ;SET ACTUAL DATA
5885  027140  004737  004526                  JSR     PC,GETALL         ;GET REGS FOR PRINTOUT
5886                                  ;REPORT REG MISCOMPARE
5887  027144                                  ERRDF   3,EM3,ERR3
  (4) 027144  104455                                                                TRAP    C$ERDF
  (5) 027146  000003                                                                .WORD   3
  (5) 027150  012222                                                                .WORD   EM3
  (5) 027152  015142                                                                .WORD   ERR3
5888  027154                                  ESCAPE  TST
  (3) 027154  104410                                                                TRAP    C$ESCAPE
  (3) 027156  000132                                                                .WORD   L10052-.
5889  027160                          20$:
```

```
                                ;-------------------------------------------------------------------
                                ; LOAD AND COMPARE REST OF CHARS, MONITOR ORDY, OCOR
                                ;-------------------------------------------------------------------
027160  020327  000377       24$:    CMP     R3,#255.        ;SEE IF ALL CHARS LOADED YET
027164  003010                       BGT     26$             ;BR IF YES
027166  010337  002422               MOV     R3,TXWORD       ;SET DATA TO BE WRITTEN
027172  004737  005174               JSR     PC,LDTXSI       ;LOAD DATA CHAR INTO TX SILO
027176  005203                       INC     R3              ;INCR DATA TO BE WRITTEN
027200  004737  004662               JSR     PC,OSIRDY       ;CHK ORDY=0, OCOR=1
027204  000002                       2
027206  005204               26$:    INC     R4              ;INCR PAT FOR READING
027210  004737  005254               JSR     PC,STPLU        ;CLOCK LINE UNIT FOR 8 CYCLES
027214  000010                       8.
027216  004737  004124               JSR     PC,READAX       ;READ AX1-15
027222  123704  002370               CMPB    RAX15,R4        ;COMPARE AX1-15 TO EXPECTED
027226  001415                       BEQ     27$             ;BR IF MATCH
027230  010437  002404               MOV     R4,GOODAT       ;SET EXPECTED DATA
027234  013737  002370  002406       MOV     RAX15,BADDAT    ;SET ACTUAL DATA
027242  004737  004526               JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                                ;REPORT REG MISCOMPARE
                                        ERRDF   3,EM3,ERR3
027246
  (4)   027246  104455                                                  TRAP    C$ERDF
  (5)   027250  000003                                                  .WORD   3
  (5)   027252  012222                                                  .WORD   EM3
  (5)   027254  015142                                                  .WORD   ERR3
027256                                  ESCAPE  TST
  (3)   027256  104410                                                  TRAP    C$ESCAPE
  (3)   027260  000030                                                  .WORD   L10052-.
027262  020427  000377       27$:    CMP     R4,#255.        ;SEE IF WE READ LAST CHAR YET
027266  001004                       BNE     29$             ;BR IF NOT
027270  004737  004662               JSR     PC,OSIRDY       ;CHK ORDY=1, OCOR=0
027274  000001                       1
027276  000404                       BR      A3
027300  004737  004662       29$:    JSR     PC,OSIRDY       ;CHK ORDY=1, OCOR=1
027304  000003                       3
027306  000724                       BR      24$             ;CONTINUE
027310                          A3:
027310                          ENDTST
027310                                                          L10052:
  (3)   027310  104401                                                  TRAP    C$ETST
027312
027314
027316
027320
027322
                                ;;*****************************************************************************
                                .SBTTL      TEST 23 - TX MSG TIMING TEST, CHAR MODE, WITH CRC
                                ;*
                                ;* IN THIS TEST, AN ENTIRE MESSAGE IS TRANSMITTED (USING STEPLU AND LULOOP)
                                ;* AND THE PROGRAM MONITORS THE OCCURRENCE OF USYRT TX BUFFER EMPTY FLAGS
                                ;* (BY SCANNING ORDY AND OCOR) AND OACT, AT EACH STEP. THE TEST IS DONE IN
                                ;* CHARACTER ORIENTED PROTOCOL MODE, USING 8-BIT CHARS AND CRC-16.
                                ;* THE FOLLOWING STEPS ARE DONE:
                                ;* A MASTER CLEAR IS DONE, AND THE LINE UNIT IS PLACED IN CHAR MODE.
                                ;* SOM IS SET TWICE TO SEND 2 SYNCH CHARS. THEN, 2 000 CHARS ARE SENT, AND
                                ;* THEN 2 TERMINATING SYNCHS ARE SENT.
```

```
                        ;* THE TRANSMITTER IS THEN DISABLED, USING OC, AND OACT IS MONITORED FOR THE
                        ;* CLEARED STATE AFTER THE 3RD SYNCH COMPLETES.
                        ;;*****************************************************************************
                        BGNTST
                                                                                        T23::
                                MOV     #A4,RETADR      ;SET TEST EXIT ADDRESS FOR ERRORS
                                JSR     PC,INITRN       ;DO MASTER CLR, LOAD 2 SOM'2
                                SYNCH
                                STRIP!DDCMP
                                JSR     PC,TXCHAR       ;LOAD A 000 CHAR, TX FIRST SYNCH (226)
                                000
                                CHPCHK!8.
                                JSR     PC,TXCHAR       ;LOAD 2ND 000 CHAR, TX 2ND SYNCH
                                000
                                8.
                                JSR     PC,TXCHAR       ;LOAD EOM CHAR, TX FIRS1 000 CHAR
                                TXEOM
                                8.
                                JSR     PC,TXCHAR       ;LOAD EOM CHAR, TX 2ND 000 CHAR
                                TXEOM
                                8.
                                JSR     PC,TXCHAR       ;LOAD EOM, TX CRC-16 CHAR
                                TXEOM
                                16.
                                JSR     PC,TXCHAR       ;LOAD EOM, TX FIRST TERMINATING SYNCH
                                TXEOM
                                8.
                                JSR     PC,TXCHAR       ;LOAD EOM, TX 2ND TERMINATING SYNCH
                                TXEOM
                                8.
                                JSR     PC,ENDTRN       ;SET OC, MONITOR OCOR
                        A4:
                                JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR TO CLEAN UP
                        ENDTST
                                                                                L10053:
                                                                                        TRAP    C$ETST
```

```
                        ;;*****************************************************************************
                        .SBTTL      TEST 24 - TX MSG TIMING TEST, BIT MODE, WITH CRC
                        ;*
                        ;* IN THIS TEST, AN ENTIRE MESSAGE IS TRANSMITTED (USING STEPLU AND LULOOP)
                        ;* AND THE PROGRAM MONITORS THE OCCURRENCE OF USYRT TX BUFFER EMPTY FLAGS
                        ;* (BY SCANNING ORDY AND OCOR) AND OACT, AT EACH STEP. THE TEST IS DONE IN
                        ;* BIT ORIENTED PROTOCOL MODE, USING 8-BIT CHARS AND CRC-CCITT-1.
                        ;* THE FOLLOWING STEPS ARE DONE:
                        ;* A MASTER CLEAR IS DONE, AND THE LINE UNIT IS PLACED IN BIT MODE.
                        ;* SOM IS SET TWICE TO SEND 2 FLAG CHARS. THEN, 2 000 CHARS ARE SENT, AND
                        ;* THEN 2 TERMINATING FLAGS ARE SENT.
                        ;* THE TRANSMITTER IS THEN DISABLED, USING OC, AND OACT IS MONITORED FOR THE
                        ;* CLEARED STATE.
                        ;;*****************************************************************************
                        BGNTST
```

```
 (3)  027432                                                                    T24::
5991  027432  012737  027534  002362        MOV     #A5,RETADR      ;SET TEST EXIT ADDRESS FOR ERRORS
5992  027440  004737  005540                JSR     PC,INITRN       ;DO MASTER CLR, LOAD 2 SOM'2
5993  027444  000000                        000
5994  027446  000000                        000
5995  027450  004737  006122                JSR     PC,TXCHAR       ;LOAD A 000 CHAR, TX FIRST FLAG
5996  027454  000000                        000
5997  027456  100010                        CHPCHK!8.
5998  027460  004737  006122                JSR     PC,TXCHAR       ;LOAD 2ND 000 CHAR, TX 2ND FLAG
5999  027464  000000                        000
6000  027466  000010                        8.
6001  027470  004737  006122                JSR     PC,TXCHAR       ;LOAD EOM CHAR, TX FIRST 000 CHAR
6002  027474  001000                        TXEOM
6003  027476  000010                        8.
6004  027500  004737  006122                JSR     PC,TXCHAR       ;LOAD EOM, TX 2ND 000 CHAR AND CRC-CCITT-1 CHAR
6005  027504  001000                        TXEOM
6006  027506  000030                        24.
6007  027510  004737  006122                JSR     PC,TXCHAR       ;LOAD EOM, TX FIRST TERMINATING FLAG
6008  027514  001000                        TXEOM
6009  027516  000010                        8.
6010  027520  004737  006122                JSR     PC,TXCHAR       ;LOAD EOM, TX 2ND TERMINATING FLAG
6011  027524  001000                        TXEOM
6012  027526  000010                        8.
6013  027530  004737  006274                JSR     PC,ENDTRN       ;SET OC, MONITOR OCOR
6014  027534                          A5:
6015  027534  004737  003576                JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR TO CLEAN UP
6016  027540                          ENDTST
 (3)  027540                                                                    L10054:
 (3)  027540  104401                                                                TRAP    C$ETST
6017
6018
6019
6020
6021
6022                                ;;*************************************************************************************
6023                                .SBTTL      TEST 25 - TX MSG TIMING TEST, CHAR MODE, WITH NO CRC
6024                                ;*
6025                                ;* IN THIS TEST, AN ENTIRE MESSAGE IS TRANSMITTED (USING STEPLU AND LULOOP)
6026                                ;* AND THE PROGRAM MONITORS THE OCCURRENCE OF USYRT TX BUFFER EMPTY FLAGS
6027                                ;* (BY SCANNING ORDY AND OCOR) AND OACT, AT EACH STEP. THE TEST IS DONE IN
6028                                ;* CHARACTER ORIENTED PROTOCOL MODE, USING 8-BIT CHARS AND NO ERROR CHECKING.
6029                                ;* THE FOLLOWING STEPS ARE DONE:
6030                                ;* A MASTER CLEAR IS DONE, AND THE LINE UNIT IS PLACED IN CHAR MODE.
6031                                ;* SOM IS SET TWICE TO SEND 2 SYNCH CHARS. THEN, 2 000 CHARS ARE SENT, AND
6032                                ;* THEN 2 TERMINATING SYNCHS ARE SENT.
6033                                ;* THE TEST IS PERFORMED WITH TXEN (REG14, BIT6) SET, AND THE PROGRAM CHECKS
6034                                ;* THAT THIS HOLDS RTS HIGH PAST THE END OF THE MESSAGE.
6035                                ;* THE TRANSMITTER IS THEN DISABLED, USING OC, AND OACT IS MONITORED FOR THE
6036                                ;* CLEARED STATE.
6037                                ;;*************************************************************************************
6038  027542                        BGNTST
 (3)  027542                                                                    T25::
6039  027542  012737  027730  002362        MOV     #A6,RETADR      ;SET TEST EXIT ADDRESS FOR ERRORS
6040  027550  004737  005540                JSR     PC,INITRN       ;DO MASTER CLR, LOAD 2 SOM'2
6041  027554  000226                        SYNCH
6042  027556  000311                        CRC2!CRC1!STRIP!DDCMP
```

```
 6043  027560  012737  000014  002400          MOV     #14,REGNUM      ;SET REG NO. = 14
 6044  027566  012737  000100  002366          MOV     #TXEN,WRIBYT    ;SET TXEN BIT
 6045  027574  004737  003750                  JSR     PC,WRITLU       ;LOAD TXEN BIT IN REG 14
 6046  027600  004737  006122                  JSR     PC,TXCHAR       ;LOAD A 000 CHAR, TX FIRST SYNCH (226)
 6047  027604  000000                          000
 6048  027606  100010                          CHPCHK!8.
 6049  027610  004737  006122                  JSR     PC,TXCHAR       ;LOAD 2ND 000 CHAR, TX 2ND SYNCH
 6050  027614  000000                          000
 6051  027616  000010                          8.
 6052  027620  004737  006122                  JSR     PC,TXCHAR       ;LOAD EOM CHAR, TX FIRST 000 CHAR
 6053  027624  001000                          TXEOM
 6054  027626  000010                          8.
 6055  027630  004737  006122                  JSR     PC,TXCHAR       ;LOAD EOM CHAR, TX 2ND 000 CHAR
 6056  027634  001000                          TXEOM
 6057  027636  000010                          8.
 6058  027640  004737  006122                  JSR     PC,TXCHAR       ;LOAD EOM, TX FIRST TERMINATING SYNCH
 6059  027644  001000                          TXEOM
 6060  027646  000010                          8.
 6061  027650  004737  006122                  JSR     PC,TXCHAR       ;LOAD EOM, TX 2ND TERMINATING SYNCH
 6062  027654  001000                          TXEOM
 6063  027656  000010                          8.
 6064  027660  004737  005254                  JSR     PC,STPLU        ;CLK PAST END OF MSG
 6065  027664  000030                          24.
 6066  027666  012737  000013  002400          MOV     #13,REGNUM      ;SET REG NO. = 13
 6067  027674  004737  003672                  JSR     PC,READLU       ;READ REG 13
 6068  027700  032737  000040  002364          BIT     #RTS,REDBYT     ;CHK FOR RTS STILL SET
 6069  027706  001006                          BNE     3$              ;BR IF RTS SET
 6070  027710  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
 6071                                  ;REPORT RTS NOT SET
 6072  027714                                  ERRDF   60,EM60,ERR7
   (4) 027714  104455                                                          TRAP    C$ERDF
   (5) 027716  000074                                                          .WORD   60
   (5) 027720  014232                                                          .WORD   EM60
   (5) 027722  017472                                                          .WORD   ERR7
 6073  027724  004737  006274          3$:     JSR     PC,ENDTRN       ;SET OC, MONITOR OCOR
 6074  027730                          A6:
 6075  027730  004737  003576                  JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR TO CLEAN UP
 6076  027734                          ENDTST
   (3) 027734                                                                L10055:
   (3) 027734  104401                                                          TRAP    C$ETST
 6077
 6078
 6079
 6080
 6081
 6082                                  ;;*************************************************************************************
 6083                                  .SBTTL      TEST 26 - TX UNDERRUN SET AND CLEAR TEST - CHAR MODE
 6084                                  ;*
 6085                                  ;* IN THIS TEST, A TX UNDERRUN ERROR IS FORCED IN EACH OF 2 SITUATIONS,
 6086                                  ;* AND THEN CLEARED DIFFERENTLY IN EACH.
 6087                                  ;* IN THE FIRST, A MESSAGE IS INITIATED, A 000 CHAR IS SENT, AND THE TX
 6088                                  ;* BUFFEP IS NOT SERVICED IN RESPONSE TO THE USYRT TX BUFFER EMPTY FLAG,
 6089                                  ;* WHICH CAUSES UNRR TO SET IN REG 11. THEN, SOM IS SET TO CLEAR THE ERROR,
 6090                                  ;* AND THIS IS VERIFIED.
 6091                                  ;* IN THE SECOND SITUATION, A MSG IS INITIATED, A 000 CHAR IS SENT, AND THE TX
 6092                                  ;* BUFFER IS NOT SERVICED IN RESPONSE TO THE USYRT TX BUFFER EMPTY FLAG, WHICH
```

```
                        ;* AGAIN CAUSES UNRR TO SET. THEN, A MASTER CLEAR IS DONE, AND THE UNRR BIT
                        ;* IS CHECKED TO BE CLEARED.
                        ;;*****************************************************************************
027736                  BGNTST
(3)  027736                                                                     T26::
                        ;-------------------------------------------------------------------------
                        ; CAUSE TX UNDERRUN, CHK UNRR = 1; SET SOM, CHK UNRR = 0
                        ;-------------------------------------------------------------------------
027736 012737 030274 002362         MOV     #A7,RETADR      ;SET TEST EXIT ADDRESS FOR ERRORS
027744 004737 005540                JSR     PC,INITRN       ;DO MASTER CLEAR, LOAD 2 SOM'S
027750 000226                       SYNCH
027752 000011                       STRIP!DDCMP
027754 004737 006122                JSR     PC,TXCHAR       ;LOAD A 000 CHAR, TX FIRST SYNCH
027760 000000                       000
027762 100010                       CHPCHK!8.
027764 004737 005254                JSR     PC,STPLU        ;CLOCK THE TRANSMITTER UNTIL 7 BITS OF
027770 000016                       14.                     ;    THE 000 CHAR HAVE BEEN TRANSMITTED
027772 012737 000011 002400         MOV     #11,REGNUM      ;SET LU REG NO. = 11
030000 004737 003672                JSR     PC,READLU       ;READ REG 11
030004 132737 000001 002364         BITB    #UNRR,REDBYT    ;CHK FOR UNRR = 0
030012 001410                       BEQ     6$              ;BR IF UNRR = 0
030014 004737 004526                JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                        ;REPORT UNRR NOT CLEARED
030020                              ERRDF   16,EM16,ERR7
(4)  030020 104455                                                              TRAP    C$ERDF
(5)  030022 000020                                                              .WORD   16
(5)  030024 012624                                                              .WORD   EM16
(5)  030026 017472                                                              .WORD   ERR7
030030 000137 030274                JMP     A7              ;SKIP TO END OF TEST
030034 004737 005254        6$:     JSR     PC,STPLU        ;CLOCK LAST BIT OF 000 CHAR
030040 000003                       3
030042 004737 003672                JSR     PC,READLU       ;READ REG 11
030046 132737 000001 002364         BITB    #UNRR,REDBYT    ;CHK FOR UNRR = 1
030054 001010                       BNE     9$              ;BR IF UNRR = 1
030056 004737 004526                JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                        ;REPORT UNRR NOT SET
030062                              ERRDF   14,EM14,ERR7
(4)  030062 104455                                                              TRAP    C$ERDF
(5)  030064 000016                                                              .WORD   14
(5)  030066 012560                                                              .WORD   EM14
(5)  030070 017472                                                              .WORD   ERR7
030072 000137 030274                JMP     A7              ;SKIP TO END OF TEST
030076 013737 000001 002422 9$:     MOV     ^H#TXSOM,TXWORD ;SET SOM CHAR TO BE WRITTEN
030104 004737 005174                JSR     PC,LDTXSI       ;LOAD SOM CHAR INTO TX SILO
030110 004737 005146                JSR     PC,WAIT50       ;WAIT FOR SILO DATA TO RIPPLE
030114 004737 005254                JSR     PC,STPLU        ;CLOCK LU FOR 2 CYCLES
030120 000002                       2
030122 004737 003672                JSR     PC,READLU       ;READ REG 11
030126 132737 000001 002364         BITB    #UNRR,REDBYT    ;CHK FOR UNRR = 0
030134 001410                       BEQ     12$             ;BR IF UNRR = 0
030136 004737 004526                JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                        ;REPORT UNRR NOT CLEARED BY SOM
030142                              ERRDF   13,EM13,ERR7
(4)  030142 104455                                                              TRAP    C$ERDF
(5)  030144 000015                                                              .WORD   13
```

```
  (5)  030146  012530                                                                    .WORD   EM13
  (5)  030150  017472                                                                    .WORD   ERR7
6138   030152  000137  030274                    JMP     A7              ;SKIP TO END OF TEST
6139   030156                                    12$:
6140                                             ;-------------------------------------------------------------------------------
6141                                             ;CAUSE TX UNDERRUN, CHK UNRR = 1; DO MASTER CLR, CHK UNRR = 0
6142                                             ;-------------------------------------------------------------------------------
6143   030156  004737  005540                    JSR     PC,INITRN       ;DO MASTER CLEAR, LOAD 2 SOM'S
6144   030162  000226                            SYNCH
6145   030164  000051                            IDLE!STRIP!DDCMP
6146   030166  004737  006122                    JSR     PC,TXCHAR       ;LOAD A 000 CHAR, TX FIRST SYNCH
6147   030172  000000                            000
6148   030174  100010                            CHPCHK!8.
6149   030176  004737  005254                    JSR     PC,STPLU        ;STEP THE LU UNTIL 000 HAS BEN TRANSMITTED
6150   030202  000021                            17.
6151   030204  004737  003672                    JSR     PC,READLU       ;READ REG 11
6152   030210  132737  000001  002364            BITB    #UNRR,REDBYT    ;CHK FOR UNR = 1
6153   030216  001010                            BNE     16$             ;BR IF UNRR = 1
6154   030220  004737  004526                    JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
6155                                            ;REPORT UNRR NOT SET
6156   030224                                    ERRDF   14,EM14,ERR7
  (4)  030224  104455                                                                    TRAP    C$ERDF
  (5)  030226  000016                                                                    .WORD   14
  (5)  030230  012560                                                                    .WORD   EM14
  (5)  030232  017472                                                                    .WORD   ERR7
6157   030234  000137  030274                    JMP     A7              ;SKIP TO END OF TEST
6158   030240  004737  003576                    16$:    JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
6159   030244  004737  003672                    JSR     PC,READLU       ;READ REG 11
6160   030250  132737  000001  002364            BITB    #UNRR,REDBYT    ;CHK FOR UNRR = 0
6161   030256  001406                            BEQ     A7              ;BR IF UNRR = 0
6162   030260  004737  004526                    JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
6163                                            ;REPORT UNRR NOT CLEARED BY OC
6164   030264                                    ERRDF   15,EM15,ERR7
  (4)  030264  104455                                                                    TRAP    C$ERDF
  (5)  030266  000017                                                                    .WORD   15
  (5)  030270  012575                                                                    .WORD   EM15
  (5)  030272  017472                                                                    .WORD   ERR7
6165   030274  004737  003576                    A7:     JSR     PC,MSTCLR       ;ISSUE CLEAN-UP MASTER CLEAR
6166   030300                                    ENDTST
  (3)  030300                                                                    L10056:
  (3)  030300  104401                                                                    TRAP    C$ETST
6167
6168
6169
6170
6171
6172                                             ;;*****************************************************************************
6173                                             .SBTTL      TEST 27 - TRANSMIT CHAR LENGTH TIMING TEST - CHAR MODE, CRC
6174                                             ;*
6175                                             ;* THE LINE UNIT IS PLACED IN CHAR MODE (DDCMP) AND A MESSAGE IS INITIATED
6176                                             ;* WITH AN 8-BIT SYNCH AND A 5-BIT SYNCH CHAR. NEXT, A 000 CHAR IS SENT WITH
6177                                             ;* EACH OF THE FOLLOWING TX CHAR LENGTHS : 5 BITS, 6 BITS, 7 BITS, 8 BITS.
6178                                             ;* (FOR EXAMPLE, A 5-BIT CHAR REQUIRES 5 CLOCK CYCLES TO BE TRANSMITTED). TWO
6179                                             ;* TERMINATING SYNCHS ARE SENT AFTER THE DATA.
6180                                             ;;*****************************************************************************
6181   030302                                    BGNTST
```

```
  (3)  030302                                                                    T27::
6182   030302  012737  030510  002362          MOV     #A8,RETADR      ;SET TEST EXIT ADDRESS FOR ERRORS
6183   030310  004737  005540                  JSR     PC,INITRN       ;DO MASTER CLR, LOAD 2 SOM'S
6184   030314  000000                          000
6185   030316  000041                          IDLE!DDCMP
6186   030320  012737  000006  002402          MOV     #6,AXNUM        ;SET BYTE NO. = 6 FOR AX3
6187   030326  012737  000000  002374          MOV     #000,WAX15      ;SET DATA FOR AX3-15 = 0
6188   030334  012737  000240  002376          MOV     #TXLEN2!TXLEN0,WAX16 ;SET TX LENGTH = 5 FOR AX3-16
6189   030342  004737  004312                  JSR     PC,WRITAX       ;LOAD AX3-15,AX3-16
6190   030346  004737  006122                  JSR     PC,TXCHAR       ;LOAD 5-BIT 000 CHAR, TX 8-BIT SYNCH
6191   030352  000000                          000
```

```
 6193  030354  100010
 6194  030356  004737  006122                      CHPCHK!8.
 6195  030362  000000                              JSR     PC,TXCHAR       ;LOAD 6-BIT 000 CHAR, TX 5-BIT SYNCH
 6196  030364  000005                              000
 6197  030366  012737  000300  002376              5
 6198  030374  004737  004312                      MOV     #TXLEN2!TXLEN1,WAX16
 6199  030400  004737  006122                      JSR     PC,WRITAX       ;SET TX CHAR LENGTH = 6
 6200  030404  000000                              JSR     PC,TXCHAR       ;LOAD 7-BIT 000 CHAR, TX 5-BIT 000 CHAR
 6201  030406  000005                              000
 6202  030410  012737  000340  002376              5
 6203  030416  004737  004312                      MOV     #TXLEN2!TXLEN1!TXLEN0,WAX16
 6204  030422  004737  006122                      JSR     PC,WRITAX       ;SET TX CHAR LENGTH = 7
 6205  030426  000000                              JSR     PC,TXCHAR       ;LOAD 8-BIT 000 CHAR, TX 6-BIT 000 CHAR
 6206  030430  000006                              000
 6207  030432  012737  000000  002376              6
 6208  030440  004737  004312                      MOV     #000,WAX16
 6209  030444  004737  006122                      JSR     PC,WRITAX       ;SET TX CHAR LENGTH = 8
 6210  030450  001000                              JSR     PC,TXCHAR       ;LOAD EOM, TX 7-BIT 000 CHAR
 6211  030452  000007                              TXEOM
 6212  030454  004737  006122                      7
 6213  030460  001000                              JSR     PC,TXCHAR       ;LOAD EOM, TX 8-BIT 000 CHAR
 6214  030462  000010                              TXEOM
 6215  030464  004737  006122                      8.
 6216  030470  001000                              JSR     PC,TXCHAR       ;LOAD EOM, TX CRC-16 CHAR
 6217  030472  000020                              TXEOM
 6218  030474  004737  006122                      16.
 6219  030500  001000                              JSR     PC,TXCHAR       ;LOAD EOM, TX FIRST TERMINATING SYNCH
 6220  030502  000010                              TXEOM
 6221  030504  004737  006274                      8.
 6222  030510                                      JSR     PC,ENDTRN       ;CLEAR TRANSMITTER
 6223  030510                              A8:
   (3) 030510                              ENDTST
   (3) 030510  104401                                                      L10057:
 6224                                                                              TRAP    C$ETST
 6225
 6226
 6227
 6228
 6229                                      ;;**************************************************************************************
 6230                                      .SBTTL      TEST 28 - TRANSMIT CHAR LENGTH TIMING TEST - BIT MODE, CRC
 6231                                      ;*
 6232                                      ;* THE LINE UNIT IS PLACED IN BIT MODE AND A MESSAGE IS INITIATED
 6233                                      ;* WITH 2 FLAG CHARS. NEXT, 2 8-BIT 000 CHARS ARE SENT, FOLLOWED BY 000 CHARS
 6234                                      ;* WITH EACH OF THE FOLLOWING TRANSMITTER CHAR LENGTHS:
 6235                                      ;*     1 BIT, 2 BITS, 3 BITS, 4 BITS, 5 BITS, 6 BITS, 7 BITS, AND 8 BITS.
 6236                                      ;* (FOR EXAMPLE, A 5-BIT CHAR REQUIRES 5 CLOCK CYCLES TO BE TRANSMITTED).
 6237                                      ;* TWO TERMINATING FLAGS ARE SENT AFTER THE DATA.
 6238                                      ;;**************************************************************************************
 6239  030512                              BGNTST
   (3) 030512                                                              T28::
 6240  030512  012737  031040  002362              MOV     #A9,RETADR      ;SET TEST EXIT ADDRESS FOR ERRORS
 6241  030520  004737  005540                      JSR     PC,INITRN       ;DO MASTER CLR, LOAD 2 SOM'S
 6242  030524  000000                              000
 6243  030526  000000                              000
 6244  030530  004737  006122                      JSR     PC,TXCHAR       ;LOAD FIRST 8-BIT 000 CHAR, TX FIRST FLAG
 6245  030534  000000                              000
```

```
6246  030536  100010                          CHPCHK!8.
6247  030540  004737  006122                  JSR     PC,TXCHAR       ;LOAD 2ND 8-BIT 000 CHAR, TX 2ND FLAG
6248  030544  000000                          000
6249  030546  000010                          8.
6250  030550  004737  006122                  JSR     PC,TXCHAR       ;LOAD 1-BIT 000 CHAR, TX FIRST 8-BIT 000 CHAR
6251  030554  000000                          000
6252  030556  000010                          8.
6253  030560  012737  000006  002402          MOV     #6,AXNUM        ;SET BYTE NO. = 6 FOR AX3
6254  030566  012737  000000  002374          MOV     #000,WAX15      ;SET DATA FOR AX3-15 = 0
6255  030574  012737  000040  002376          MOV     #TXLEN0,WAX16   ;SET TX CHAR LENGTH = 1 FOR AX3-16
6256  030602  004737  004312                  JSR     PC,WRITAX       ;LOAD AX3-15,AX3-16
6257  030606  004737  006122                  JSR     PC,TXCHAR       ;LOAD 2-BIT 000 CHAR, TX 2ND 8-BIT 000 CHAR
6258  030612  000000                          000
6259  030614  000010                          8.
6260  030616  012737  000100  002376          MOV     #TXLEN1,WAX16
6261  030624  004737  004312                  JSR     PC,WRITAX       ;SET TX CHAR LENGTH = 2
6262  030630  004737  006122                  JSR     PC,TXCHAR       ;LOAD 3-BIT 000 CHAR, TX 1-BIT 000 CHAR
6263  030634  000000                          000
6264  030636  000001                          1
6265  030640  012737  000140  002376          MOV     #TXLEN1!TXLEN0,WAX16
6266  030646  004737  004312                  JSR     PC,WRITAX       ;SET TX CHAR LENGTH = 3
6267  030652  004737  006122                  JSR     PC,TXCHAR       ;LOAD 4-BIT 000 CHAR, TX 2-BIT 000 CHAR
6268  030656  000000                          000
6269  030660  000002                          2
6270  030662  012737  000200  002376          MOV     #TXLEN2,WAX16
6271  030670  004737  004312                  JSR     PC,WRITAX       ;SET TX CHAR LENGTH = 4
6272  030674  004737  006122                  JSR     PC,TXCHAR       ;LOAD 5-BIT 000 CHAR, TX 3-BIT 000 CHAR
6273  030700  000000                          000
6274  030702  000003                          3
6275  030704  012737  000240  002376          MOV     #TXLEN2!TXLEN0,WAX16
6276  030712  004737  004312                  JSR     PC,WRITAX       ;SET TX CHAR LENGTH = 5
6277  030716  004737  006122                  JSR     PC,TXCHAR       ;LOAD 6-BIT 000 CHAR, TX 4-BIT 000 CHAR
6278  030722  000000                          000
6279  030724  000004                          4
6280  030726  012737  000300  002376          MOV     #TXLEN2!TXLEN1,WAX16
6281  030734  004737  004312                  JSR     PC,WRITAX       ;SET TX CHAR LENGTH = 6
6282  030740  004737  006122                  JSR     PC,TXCHAR       ;LOAD 7-BIT 000 CHAR, TX 5-BIT 000 CHAR
6283  030744  000000                          000
6284  030746  000005                          5
6285  030750  012737  000340  002376          MOV     #TXLEN2!TXLEN1!TXLEN0,WAX16
6286  030756  004737  004312                  JSR     PC,WRITAX       ;SET TX CHAR LENGTH = 7
6287  030762  004737  006122                  JSR     PC,TXCHAR       ;LOAD 8-BIT 000 CHAR, TX 6-BIT 000 CHAR
6288  030766  000000                          000
6289  030770  000006                          6
6290  030772  012737  000000  002376          MOV     #000,WAX16
6291  031000  004737  004312                  JSR     PC,WRITAX       ;SET TX CHAR LENGTH = 8
6292  031004  004737  006122                  JSR     PC,TXCHAR       ;LOAD EOM, TX 7-BIT 000 CHAR
6293  031010  001000                          TXEOM
6294  031012  000007                          7
6295  031014  004737  006122                  JSR     PC,TXCHAR       ;LOAD EOM, TX 8-BIT 000 CHAR, CRC-CCITT-1 CHAR
6296  031020  001000                          TXEOM
6297  031022  000031                          25.
6298  031024  004737  006122                  JSR     PC,TXCHAR       ;LOAD EOM, TX FIRST TERMINATING FLAG
6299  031030  001000                          TXEOM
6300  031032  000010                          8.
6301  031034  004737  006274                  JSR     PC,ENDTRN       ;CLEAR TRANSMITTER
```

```
                        A9:
                        ENDTST
                                                                L10060:
                                                                        TRAP    C$ETST


                        ;;*************************************************************************************
                        .SBTTL      TEST 29 - TXDATA BIT TEST - CHAR MODE, CRC
                        ;*
                        ;* THE LINE UNIT IS INITIALIZED AND A MSG IS INITIATED (USING STEPLU) WITH CRC-
                        ;* 16 SELECTED IN CHAR MODE. TWO SYNCHS, 000,125,252,377,000, AND 2 TERMINATING
                        ;* SYNCHS ARE THEN SENT. THE PROGRAM CHECKS EACH BIT OF THE TRANSMITTED
                        ;* DATA CHARS, BY MONITORING TXDATA (REG 17) AS THE DATA IS CLOCKED OUT OF
                        ;* THE USYRT TRANSMITTER.
                        ;;*************************************************************************************
031042                  BGNTST
                                                                T29::
004737 005540                   JSR     PC,INITRN       ;DO MASTER CLR, LOAD 2 SOM'S
000226                          SYNCH
000011                          STRIP!DDCMP
012701 003224                   MOV     #MSG1+4,R1      ;GET POINTER TO DATA
010103                          MOV     R1,R3
012137 002422           3$:     MOV     (R1)+,TXWORD
004737 005174                   JSR     PC,LDTXSI       ;LOAD A DATA CHAR INTO TX SILO
020127 003242                   CMP     R1,#MSG1+18.    ;SEE IF ALL CHARS LOADED YET
103771                          BLO     3$              ;BR IF NOT YET
004737 005146                   JSR     PC,WAIT50       ;WAIT FOR SILO TO RIPPLE
004737 005254                   JSR     PC,STPLU        ;CLOCK LU UNTIL SYNCHS ARE TX'D
100020                          CHPCHK!16.
011337 031120           6$:     MOV     (R3),8$         ;GET EXPECTED DATA CHAR
004737 011176                   JSR     PC,CKTBIT       ;CHECK TXDATA FOR CHAR BITS
000000                  8$:     .WORD   0               ;EXPECTED CHAR GOES HERE
062703 000002                   ADD     #2,R3           ;INCR PATTERN POINTER
020327 003236                   CMP     R3,#MSG1+14.    ;SEE IF ALL CHARS CHECKED YET
103766                          BLO     6$              ;BR IF NOT YET
004737 003576           16$:    JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR TO CLEAN UP
                        ENDTST
                                                                L10061:
                                                                        TRAP    C$ETST


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

```
                        ;;*****************************************************************************
                        BGNTST
                                                                                        T30::
031142                  MOV     #24$,RETADR     ;SET TEST EXIT ADDRESS FOR ERRORS
031150                  JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
031154                  JSR     PC,SETUP        ;PROGRAM THE USYRT
031160                  SYNCH
031162                  STRIP!IERR!DDCMP
031164                  000
031166                  000
031170                  MOV     #12,REGNUM      ;SET LU REG NO. = 12
031176                  CLR     AXNUM           ;SET AX BYTE NO. = 0 FOR AX0
031202                  MOVB    #LULP,WRIBYT
031210                  JSR     PC,WRITLU       ;SET LULP IN REG 12
031214                  MOV     #MSG1,R1        ;GET POINTER TO MSG DATA TABLE
031220          3$:     MOV     (R1)+,TXWORD    ;GET CHAR TO BE LOADED
031224                  JSR     PC,LDTXSI       ;LOAD CHAR INTO TX SILO
031230                  CMP     R1,#MSG1+22.    ;SEE IF ALL MSG CHARS LOADED YET
031234                  BLO     3$              ;BR IF NOT YET
031236                  JSR     PC,WAIT50       ;ALLOW DATA TO RIPPLE IN SILO
031242                  JSR     PC,STPLU        ;CLOCK LU FOR 40 CYCLES (UNTIL FIRST
031246                  40.                     ;   DATA CHAR IS ABOUT TO BE RECEIVED)
031250                  JSR     PC,IACTIV       ;CHK IACT = 0
031254                  0
031256                  JSR     PC,STPLU        ;CLOCK LU UNTIL 1ST DATA CHAR IS RCV'D
031262                  6
031264                  MOV     #MSG1+4,R1
031270          10$:    JSR     PC,IACTIV       ;CHK IACT = 1
031274                  1
031276                  JSR     PC,READAX       ;READ AX0
031302                  CMP     RAX15,(R1)+     ;COMPARE RCV'D CHAR TO EXPECTED
031306                  BEQ     12$             ;BR IF RCV'D DATA OK
031310                  MOV     -2(R1),GOODAT   ;GET EXPECTED DATA
031316                  MOV     RAX15,BADDAT    ;GET ACTUAL DATA
031324                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                        ;REPORT INCORRECT DATA CHAR RCV'D
031330                  ERRDF   26,EM26,ERR3
104455                                                          TRAP    C$ERDF
000032                                                          .WORD   26
013071                                                          .WORD   EM26
015142                                                          .WORD   ERR3
000461                  BR      24$
005254          12$:    JSR     PC,STPLU        ;CLOCK LU 8 CYCLES
000010                  8.
020127 003236           CMP     R1,#MSG1+14.    ;SEE IF CHECKING HI CRC BYTE YET
103745                  BLO     10$             ;BR IF NOT YET
006714                  JSR     PC,IACTIV       ;CHK IACT = 1
000001                  1
004124                  JSR     PC,READAX       ;READ AX0
123727 002370 000160    CMPB    RAX15,#160      ;CMP RCV'D CHAR TO EXPECTED HI CRC BYTE
001415                  BEQ     16$             ;BR IF HI CRC BYTE RCV'D OK
012737 000160 002404    MOV     #160,GOODAT     ;GET EXPECTED DATA
013737 002370 002406    MOV     RAX15,BADDAT    ;SET ACTUAL DATA
004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                        ;REPORT INCORRECT CRC BYTE RCV'D
031420                  ERRDF   27,EM27,ERR3
```

```
 (4)  031420  104455                                                                    TRAP    C$ERDF
 (5)  031422  000033                                                                    .WORD   27
 (5)  031424  013123                                                                    .WORD   EM27
 (5)  031426  015142                                                                    .WORD   ERR3
6404  031430  000425                          BR      24$
6405  031432  004737  005254          16$:    JSR     PC,STPLU        ;CLOCK LU FOR 8 CYCLES
6406  031436  000010                          8.
6407  031440  004737  006714                  JSR     PC,IACTIV       ;CHK IACT = 1
6408  031444  000001                          1
6409  031446  012737  000034  002404          MOV     #034,GOODAT     ;GET EXPECTED LO CRC BYTE
6410  031454  004737  004124                  JSR     PC,READAX       ;READ AX0
6411  031460  123727  002370  000034          CMPB    RAX15,#034      ;CMP RCV'D CHAR TO EXPECTED LO CRC BYTE
6412  031466  001347                          BNE     14$             ;BR IF LO CRC INCORRECT
6413  031470  004737  005254                  JSR     PC,STPLU        ;CLOCK LU 8 CYCLES
6414  031474  000010                          8.
6415  031476  004737  006714                  JSR     PC,IACTIV       ;CHK IACT STILL = 1
6416  031502  000001                          1
6417  031504  004737  003576          24$:    JSR     PC,MSTCLR       ;ISSUE CLEAN-UP MASTER CLEAR
6418  031510                          ENDTST
 (3)  031510                                                                                    L10062:
 (3)  031510  104401                                                                    TRAP    C$ETST
6419
6420
6421
6422
6423
6424                                    ;;**************************************************************************************
6425                                    .SBTTL      TEST 31 - USYRT RECEIVER MSG TEST - BIT MODE, CRC
6426                                    ;*
6427                                    ;* THE LINE UNIT IS INITIALIZED AND A MESSAGE IS INITIATED (USING STEPLU) WITH
6428                                    ;* LULP (REG 12) SET TO LOOP THE DATA INTERNALLY IN THE USYRT, AND WITH CRC-
6429                                    ;* CCITT-1. TWO FLAGS, 000,125,252,377,000, AND TWO TERMINATING FLAGS ARE THEN
6430                                    ;* SENT. THE PROGRAM MONITORS IACT, RSOM, AND THE RCV'D CHARS ARE READ
6431                                    ;* FROM AX0-15 AND COMPARED TO EXPECTED VALUES. THE PROGRAM THEN CHECKS FOR
6432                                    ;* IACT = 0, SETS IC TO CLEAR THE RECEIVER, AND CHECKS FOR IACT STILL = 0.
6433                                    ;;**************************************************************************************
6434  031512                            BGNTST
 (3)  031512                                                                                    T31::
6435  031512  012737  032046  002362          MOV     #24$,RETADR     ;SET TEST EXIT ADDRESS FOR ERRORS
6436  031520  004737  003576                  JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
6437  031524  004737  010640                  JSR     PC,SETUP        ;PROGRAM THE USYRT
6438  031530  000000                          000
6439  031532  000002                          IERR
6440  031534  000000                          000
6441  031536  000000                          000
6442  031540  012737  000012  002400          MOV     #12,REGNUM      ;SET LU REG NO. = 12
6443  031546  005037  002402                  CLR     AXNUM           ;SET AX BYTE NO. = 0 FOR AX0
6444  031552  112737  000040  002366          MOVB    #LULP,WRIBYT
6445  031560  004737  003750                  JSR     PC,WRITLU       ;SET LULP IN REG 12
6446  031564  012701  003220                  MOV     #MSG1,R1        ;GET POINTER TO MSG DATA TABLE
6447  031570  012137  002422          3$:     MOV     (R1)+,TXWORD    ;GET CHAR TO BE LOADED
6448  031574  004737  005174                  JSR     PC,LDTXSI       ;LOAD CHAR INTO TX SILO
6449  031600  020127  003242                  CMP     R1,#MSG1+18.    ;SEE IF ALL MSG CHARS LOADED YET
6450  031604  103771                          BLO     3$              ;BR IF NOT YET
6451  031606  004737  005146                  JSR     PC,WAIT50       ;ALLOW DATA TO RIPPLE IN SILO
6452  031612  004737  005254                  JSR     PC,STPLU        ;CLOCK LU FOR 50 CYCLES (UNTIL FIRST
```

```
6453  031616  000062                          50.                     ;   DATA CHAR IS ABOUT TO BE RECEIVED)
6454  031620  004737  006714                  JSR     PC,IACTIV       ;CHK IACT = 0
6455  031624  000000                          0
6456  031626  004737  007102                  JSR     PC,RSEOM        ;CHK RSOM = 0, REOM = 0
6457  031632  000000                          0
6458  031634  004737  005254                  JSR     PC,STPLU        ;CLOCK LU UNTIL 1ST DATA CHAR IS RCV'D
6459  031640  000006                          6
6460  031642  012701  003224                  MOV     #MSG1+4,R1
6461  031646  020127  003224          5$:     CMP     R1,#MSG1+4      ;SEE IF 1ST CHAR RCV'D
6462  031652  001007                          BNE     6$              ;BR IF NO
6463  031654  004737  006714                  JSR     PC,IACTIV       ;CHK IACT = 1
6464  031660  000001                          1
6465  031662  004737  007102                  JSR     PC,RSEOM        ;CHK RSOM = 1, REOM = 0
6466  031666  000001                          1
6467  031670  000420                          BR      9$
6468  031672  020127  003234          6$:     CMP     R1,#MSG1+12.    ;SEE IF LAST CHAR RCV'D
6469  031676  001007                          BNE     8$              ;BR IF NO
6470  031700  004737  006714                  JSR     PC,IACTIV       ;CHK FOR IACT = 0
6471  031704  000000                          0
6472  031706  004737  007102                  JSR     PC,RSEOM        ;CHK RSOM = 0, REOM = 0
6473  031712  000000                          0
6474  031714  000406                          BR      9$
6475  031716  004737  006714          8$:     JSR     PC,IACTIV       ;CHK FOR IACT = 1
6476  031722  000001                          1
6477  031724  004737  007102                  JSR     PC,RSEOM        ;CHK RSOM = 0, REOM = 0
6478  031730  000000                          0
6479  031732  004737  004124          9$:     JSR     PC,READAX       ;READ AX0
6480  031736  023721  002370                  CMP     RAX15,(R1)+     ;COMPARE RCV'D CHAR TO EXPECTED
6481  031742  001415                          BEQ     12$             ;BR IF RCV'D DATA OK
6482  031744  016137  177776  002404          MOV     -2(R1),GOODAT   ;GET EXPECTED DATA
6483  031752  013737  002370  002406          MOV     RAX15,BADDAT    ;GET ACTUAL DATA
6484  031760  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
6485                                  ;REPORT INCORRECT DATA CHAR RCV'D
6486  031764                                  ERRDF   26,EM26,ERR3
 (4)  031764  104455                                                                    TRAP    C$ERDF
 (5)  031766  000032                                                                    .WORD   26
 (5)  031770  013071                                                                    .WORD   EM26
 (5)  031772  015142                                                                    .WORD   ERR3
6487  031774  000424                          BR      24$
6488  031776  004737  005254          12$:    JSR     PC,STPLU        ;CLOCK LU 8 CYCLES
6489  032002  000010                          8.
6490  032004  020127  003236                  CMP     R1,#MSG1+14.    ;SEE IF ALL DATA CHARS CHECKED YET
6491  032010  103716                          BLO     5$              ;BR IF NOT YET
6492  032012  004737  006714                  JSR     PC,IACTIV       ;CHK IACT = 0
6493  032016  000000                          0
6494  032020  004737  007102                  JSR     PC,RSEOM        ;CHK RSOM = 0, REOM = 0
6495  032024  000000                          0
6496  032026  012737  000200  002366          MOV     #IC,WRIBYT
6497  032034  004737  003750                  JSR     PC,WRITLU       ;SET IC (INPUT CLEAR) IN REG 12
6498  032040  004737  006714                  JSR     PC,IACTIV       ;CHK IACT = 0
6499  032044  000000                          0
6500  032046  004737  003576          24$:    JSR     PC,MSTCLR       ;ISSUE CLEAN-UP MASTER CLEAR
6501  032052                          ENDTST
 (3)  032052                                                                    L10063:
 (3)  032052  104401                                                                    TRAP    C$ETST
6502
```

```
                        ;;*************************************************************************************
                        .SBTTL      TEST 32 - USYRT RECEIVER MSG TEST - CHAR MODE, NO CRC
                        ;*
                        ;* THE LINE UNIT IS INITIALIZED AND A MESSAGE IS INITIATED (USING STEPLU) WITH
                        ;* LULP (REG 12) SET TO LOOP THE DATA INTERNALLY IN THE USYRT, AND WITH NO
                        ;* ERROR DETECTION. TWO SYNCHS, 000,125,252,377,000, AND TWO SYNCHS ARE
                        ;* THEN SENT. THE PROGRAM MONITORS IACT, AND THE RECEIVED CHARS ARE READ FROM
                        ;* AX0-15 AND COMPARED TO EXPECTED VALUES. THE PROGRAM THEN CHECKS FOR IACT
                        ;* STILL = 0, SETS IC TO CLEAR THE RECEIVER, AND CHECKS FOR IACT = 0.
                        ;;*************************************************************************************
                        BGNTST
                                                                                        T32::
                                MOV     #24$,RETADR     ;SET TEST EXIT ADDRESS FOR ERRORS
                                JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
                                JSR     PC,SETUP        ;PROGRAM THE USYRT
                                SYNCH
                                CRC2!CRC1!STRIP!IERR!DDCMP
                                000
                                000
                                MOV     #12,REGNUM      ;SET LU REG NO. = 12
                                CLR     AXNUM           ;SET AX BYTE NO. = 0 FOR AX0
                                MOVB    #LULP,WRIBYT
                                JSR     PC,WRITLU       ;SET LULP IN REG 12
                                MOV     #MSG1,R1        ;GET POINTER TO MSG DATA TABLE
                        3$:     MOV     (R1)+,TXWORD    ;GET CHAR TO BE LOADED
                                JSR     PC,LDTXSI       ;LOAD CHAR INTO TX SILO
                                CMP     R1,#MSG1+18.    ;SEE IF ALL MSG CHARS LOADED YET
                                BLO     3$              ;BR IF NOT YET
                                JSR     PC,WAIT50       ;ALLOW DATA TO RIPPLE IN SILO
                                JSR     PC,STPLU        ;CLOCK LU FOR 24 CYCLES (UNTIL FIRST
                                24.                     ;   DATA CHAR IS ABOUT TO BE RECEIVED)
                                JSR     PC,IACTIV       ;CHK IACT = 0
                                0
                                JSR     PC,STPLU        ;CLOCK LU UNTIL 1ST DATA CHAR IS RCV'D
                                6
                                MOV     #MSG1+4,R1
                        10$:    JSR     PC,IACTIV       ;CHK IACT = 1
                                1
                                JSR     PC,READAX       ;READ AX0
                                CMP     RAX15,(R1)+     ;COMPARE RCV'D CHAR TO EXPECTED
                                BEQ     12$             ;BR IF RCV'D DATA OK
                                MOV     -2(R1),GOODAT   ;GET EXPECTED DATA
                                MOV     RAX15,BADDAT    ;GET ACTUAL DATA
                                JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                        ;REPORT INCORRECT DATA CHAR RCV'D
                                ERRDF   26,EM26,ERR3
                                                                        TRAP    C$ERDF
                                                                        .WORD   26
                                                                        .WORD   EM26
                                                                        .WORD   ERR3
                                BR      24$
                        12$:    JSR     PC,STPLU        ;CLOCK LU 8 CYCLES
```

```
 6554  032260  000010                              8.
 6555  032262  020127  003236                      CMP     R1,#MSG1+14.    ;SEE IF ALL 5 DATA CHARS RCV'D YET
 6556  032266  103745                              BLO     10$             ;BR IF NOT YET
 6557  032270  004737  006714                      JSR     PC,IACTIV       ;CHK FOR IACT STILL = 1
 6558  032274  000001                              1
 6559  032276  012737  000200  002366              MOV     #IC,WRIBYT
 6560  032304  004737  003750                      JSR     PC,WRITLU       ;SET IC (INPUT CLEAR) IN REG 12
 6561  032310  004737  006714                      JSR     PC,IACTIV       ;CHK IACT = 0
 6562  032314  000000                              0
 6563  032316  004737  003576          24$:        JSR     PC,MSTCLR       ;ISSUE CLEAN-UP MASTER CLEAR
 6564  032322                          ENDTST
   (3) 032322                                                                      L10064:
   (3) 032322  104401                                                                  TRAP    C$ETST
 6565
 6566
 6567
 6568
 6569
 6570                                  ;;*************************************************************************
 6571                                  .SBTTL      TEST 33 - USYRT RECEIVER MSG TEST - BIT MODE, NO CRC
 6572                                  ;*
 6573                                  ;* THE LINE UNIT IS INITIALIZED AND A MESSAGE IS INITIATED (USING STEPLU) WITH
 6574                                  ;* LULP (REG 12) SET TO LOOP THE DATA INTERNALLY IN THE USYRT, AND WITH ERROR
 6575                                  ;* DETECTION INHIBITED. TWO FLAGS, 000,125,252,377,000, AND TWO TERMINATING FLAGS
 6576                                  ;* ARE THEN SENT. THE PROGRAM MONITORS IACT, RSOM, AND THE RCV'D CHARS ARE
 6577                                  ;* READ FROM AX0-15 AND COMPARED TO EXPECTED VALUES. THE PROGRAM THEN CHECKS FOR
 6578                                  ;* IACT = 0, SETS IC TO CLEAR THE RECEIVER, AND CHECKS FOR IACT STILL = 0.
 6579                                  ;;*************************************************************************
 6580  032324                          BGNTST
   (3) 032324                                                                      T33::
 6581  032324  012737  032660  002362          MOV     #24$,RETADR
 6582  032332  004737  003576                  JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
 6583  032336  004737  010640                  JSR     PC,SETUP        ;PROGRAM THE USYRT
 6584  032342  000000                          000
 6585  032344  000302                          CRC2!CRC1!IERR
 6586  032346  000000                          000
 6587  032350  000000                          000
 6588  032352  012737  000012  002400          MOV     #12,REGNUM      ;SET LU REG NO. = 12
 6589  032360  005037  002402                  CLR     AXNUM           ;SET AX BYTE NO. = 0 FOR AX0
 6590  032364  112737  000040  002366          MOVB    #LULP,WRIBYT
 6591  032372  004737  003750                  JSR     PC,WRITLU       ;SET LULP IN REG 12
 6592  032376  012701  003220                  MOV     #MSG1,R1        ;GET POINTER TO MSG DATA TABLE
 6593  032402  012137  002422          3$:     MOV     (R1)+,TXWORD    ;GET CHAR TO BE LOADED
 6594  032406  004737  005174                  JSR     PC,LDTXSI       ;LOAD CHAR INTO TX SILO
 6595  032412  020127  003242                  CMP     R1,#MSG1+18.    ;SEE IF ALL MSG CHARS LOADED YET
 6596  032416  103771                          BLO     3$              ;BR IF NOT YET
 6597  032420  004737  005146                  JSR     PC,WAIT50       ;ALLOW DATA TO RIPPLE IN SILO
 6598  032424  004737  005254                  JSR     PC,STPLU        ;CLOCK LU FOR 33 CYCLES (UNTIL FIRST
 6599  032430  000041                          33.                     ;   DATA CHAR IS ABOUT TO BE RECEIVED)
 6600  032432  004737  006714                  JSR     PC,IACTIV       ;CHK IACT = 0
 6601  032436  000000                          0
 6602  032440  004737  007102                  JSR     PC,RSEOM        ;CHK RSOM = 0, REOM = 0
 6603  032444  000000                          0
 6604  032446  004737  005254                  JSR     PC,STPLU        ;CLOCK LU UNTIL 1ST DATA CHAR IS RCV'D
 6605  032452  000006                          6
 6606  032454  012701  003224                  MOV     #MSG1+4,R1
```

```
 6607  032460  020127  003224          5$:     CMP     R1,#MSG1+4      ;SEE IF 1ST CHAR RCV'D
 6608  032464  001007                          BNE     6$              ;BR IF NO
 6609  032466  004737  006714                  JSR     PC,IACTIV       ;CHK IACT = 1
 6610  032472  000001                          1
 6611  032474  004737  007102                  JSR     PC,RSEOM        ;CHK RSOM = 1, REOM = 0
 6612  032500  000001                          1
 6613  032502  000420                          BR      9$
 6614  032504  020127  003234          6$:     CMP     R1,#MSG1+12.    ;SEE IF LAST CHAR RCV'D
 6615  032510  001007                          BNE     8$              ;BR IF NO
 6616  032512  004737  006714                  JSR     PC,IACTIV       ;CHK FOR IACT = 0
 6617  032516  000000                          0
 6618  032520  004737  007102                  JSR     PC,RSEOM        ;CHK RSOM = 0, REOM = 0
 6619  032524  000000                          0
 6620  032526  000406                          BR      9$
 6621  032530  004737  006714          8$:     JSR     PC,IACTIV       ;CHK FOR IACT = 1
 6622  032534  000001                          1
 6623  032536  004737  007102                  JSR     PC,RSEOM        ;CHK RSOM = 0, REOM = 0
 6624  032542  000000                          0
 6625  032544  004737  004124          9$:     JSR     PC,READAX       ;READ AX0
 6626  032550  023721  002370                  CMP     RAX15,(R1)+     ;COMPARE RCV'D CHAR TO EXPECTED
 6627  032554  001415                          BEQ     12$             ;BR IF RCV'D DATA OK
 6628  032556  016137  177776  002404          MOV     -2(R1),GOODAT   ;GET EXPECTED DATA
 6629  032564  013737  002370  002406          MOV     RAX15,BADDAT    ;GET ACTUAL DATA
 6630  032572  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
 6631                          ;REPORT INCORRECT DATA CHAR RCV'D
 6632  032576                  ERRDF   26,EM26,ERR3
   (4) 032576  104455                                                          TRAP    C$ERDF
   (5) 032600  000032                                                          .WORD   26
   (5) 032602  013071                                                          .WORD   EM26
   (5) 032604  015142                                                          .WORD   ERR3
 6633  032606  000424                          BR      24$
 6634  032610  004737  005254          12$:    JSR     PC,STPLU        ;CLOCK LU 8 CYCLES
 6635  032614  000010                          8.
 6636  032616  020127  003236                  CMP     R1,#MSG1+14.    ;SEE IF ALL DATA CHARS CHECKED YET
 6637  032622  103716                          BLO     5$              ;BR IF NOT YET
 6638  032624  004737  006714                  JSR     PC,IACTIV       ;CHK IACT = 0
 6639  032630  000000                          0
 6640  032632  004737  007102                  JSR     PC,RSEOM        ;CHK RSOM = 0, REOM = 0
 6641  032636  000000                          0
 6642  032640  012737  000200  002366          MOV     #IC,WRIBYT
 6643  032646  004737  003750                  JSR     PC,WRITLU       ;SET IC (INPUT CLEAR) IN REG 12
 6644  032652  004737  006714                  JSR     PC,IACTIV       ;CHK IACT = 0
 6645  032656  000000                          0
 6646  032660  004737  003576          24$:    JSR     PC,MSTCLR       ;ISSUE CLEAN-UP MASTER CLEAR
 6647  032664                          ENDTST
   (3) 032664                                                                L10065:
   (3) 032664  104401                                                              TRAP    C$ETST
 6648
 6649
 6650
 6651
 6652
 6653                          ;;*****************************************************************************
 6654                          .SBTTL      TEST 34 - SILO-DISABLED TRANSMITTER LOAD TEST
 6655                          ;*
 6656                          ;* 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.
                        ;;*****************************************************************************
                        BGNTST
                                                                                        T34::
032666  004737 003576            JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
032672  012737 000014 002400      MOV     #14,REGNUM      ;SET REG NO. = 14
032700  012737 000040 002366      MOV     #DISSI,WRIBYT   ;SET DISSI BIT
032706  004737 003750            JSR     PC,WRITLU
032712  012737 000040 002426      MOV     #DISSI,DISILO   ;SET DISABLE SILO FLAG
032720  012737 000125 002422      MOV     #125,TXWORD     ;LOAD 125 INTO TX SILO
032726  004737 005174            JSR     PC,LDTXSI
032732  012737 000002 002402      MOV     #2,AXNUM        ;SET REG NO. FOR AX1
032740  004737 004124            JSR     PC,READAX       ;READ AX1-15, AX1-16
032744  123727 002370 000000      CMPB    RAX15,#000      ;CHECK FOR AX1-15 UNCHANGED
032752  001414                    BEQ     3$              ;BR IF UNCHANGED
032754  012737 000000 002404      MOV     #000,GOODAT     ;GET EXPECTED DATA
032762  013737 002370 002406      MOV     RAX15,BADDAT    ;GET ACTUAL DATA
032770  004737 004526            JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
                        ;REPORT REG MISCOMPARE
032774                          ERRDF   3,EM3,ERR3
032774  104455                                                          TRAP    C$ERDF
032776  000003                                                          .WORD   3
033000  012222                                                          .WORD   EM3
033002  015142                                                          .WORD   ERR3
033004  005037 002426    3$:     CLR     DISILO          ;CLEAR DISABLE SILO FLAG
033010  004737 003576            JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR TO CLEAN UP
033014                  ENDTST
033014                                                                  L10066:
033014  104401                                                          TRAP    C$ETST
                        ;;*****************************************************************************
                        .SBTTL      TEST 35 - SILO-DISABLED MESSAGE TEST - BIT MODE, NO CRC
                        ;*
                        ;* THE LINE UNIT IS INITIALIZED AND A MESSAGE IS INITIATED (USING STEPLU)
                        ;* WITH LULP (REG 12) SET TO LOOP THE DATA INTERNALLY IN THE USYRT, WITH SILO
                        ;* DISABLE SET, AND WITH NO ERROR DETECTION. TWO FLAGS, 000,125,252, AND
                        ;* TERMINATING FLAGS ARE THEN SENT BY LOADING THE TRANSMITTED CHARS INTO
                        ;* REG AX1. THE PROGRAM MONITORS OACT, IACT, RSOM, REOM, ORDY, OCOR, ICIR,
                        ;* IRDY, AND THE RECEIVED CHARS ARE READ FROM AX0 AND COMPARED TO EXPECTED
                        ;* VALUES.
                        ;;*****************************************************************************
033016                  BGNTST
                                                                                        T35::
033016  012737 033716 002362        MOV     #18$,RETADR     ;SET TEST EXIT ADDRESS FOR ERRORS
033024  004737 005540            JSR     PC,INITRN       ;FIND OUT WHICH USYRT CHIP
033030  000000                    0
033032  000000                    0
033034  004737 003576            JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
033040  004737 010640            JSR     PC,SETUP        ;PROGRAM THE USYRT
033044  000000                    000
033046  000302                    CRC2!CRC1!IERR
```

```
6705  033050  000000                          000
6706  033052  000000                          000
6707  033054  012737  000014  002400          MOV     #14,REGNUM      ;SET REG NO. = 14
6708  033062  012737  000140  002366          MOV     #TXEN!DISSI,WRIBYT
6709  033070  004737  003750                  JSR     PC,WRITLU       ;SET TXEN AND DISSI IN REG 14
6710  033074  012737  000140  002426          MOV     #TXEN!DISSI,DISILO      ;SET DISABLE SILO FLAG
6711  033102  012737  000012  002400          MOV     #12,REGNUM      ;SET LU REG NO. = 12
6712  033110  112737  000040  002366          MOVB    #LULP,WRIBYT
6713  033116  004737  003750                  JSR     PC,WRITLU       ;SET LULP IN REG 12
6714  033122  012701  003220                  MOV     #MSG1,R1        ;GET POINTER TO MSG
6715  033126  004737  004662                  JSR     PC,OSIRDY       ;CHK ORDY = 1
6716  033132  000001                          1
6717  033134  012737  000002  002402          MOV     #2,AXNUM        ;SET AX BYTE NO. FOR AX1
6718  033142  112137  002374                  MOVB    (R1)+,WAX15     ;GET A CHAR
6719  033146  112137  002376                  MOVB    (R1)+,WAX16
6720  033152  004737  004312                  JSR     PC,WRITAX       ;LOAD CHAR INTO USYRT TX BUFFER
6721  033156  004737  004662                  JSR     PC,OSIRDY       ;CHK ORDY = 0
6722  033162  000000                          0
6723  033164  004737  005352                  JSR     PC,OACTIV       ;CHK OACT = 0
6724  033170  000000                          0
6725  033172  004737  005254                  JSR     PC,STPLU        ;CLOCK LU FOR 3 CYCLES
6726  033176  000003                          3
6727  033200  004737  005352                  JSR     PC,OACTIV       ;CHK OACT = 1
6728  033204  000001                          1
6729  033206  012703  000004                  MOV     #4,R3           ;INIT COUNTER
6730  033212  112137  002374          4$:     MOVB    (R1)+,WAX15     ;GET ANOTHER CHAR
6731  033216  112137  002376                  MOVB    (R1)+,WAX16
6732  033222  020327  000001                  CMP     R3,#1           ;SEE IF LOADING LAST DATA CHAR YET
6733  033226  001006                          BNE     5$              ;BR IF NOT
6734  033230  005737  002430                  TST     CHPTYP          ;SEE IF SIG USYRT
6735  033234  001403                          BEQ     5$              ;BR IF YES
6736  033236  112737  000002  002376          MOVB    #TEOM,WAX16     ;SET TEOM WITH LAST DATA CHAR
6737  033244  004737  004662          5$:     JSR     PC,OSIRDY       ;CHK ORDY = 1
6738  033250  000001                          1
6739  033252  004737  004312                  JSR     PC,WRITAX       ;LOAD ANOTHER CHAR INTO USYRT TX BUFFER
6740  033256  004737  004662                  JSR     PC,OSIRDY       ;CHK ORDY = 0
6741  033262  000000                          0
6742  033264  004737  006714                  JSR     PC,IACTIV       ;CHK IACT = 0
6743  033270  000000                          0
6744  033272  004737  007102                  JSR     PC,RSEOM        ;CHK RSOM = 0, REOM = 0
6745  033276  000000                          0
6746  033300  004737  005254                  JSR     PC,STPLU        ;CLOCK LU FOR 8 CYCLES
6747  033304  000010                          8.
6748  033306  004737  005352                  JSR     PC,OACTIV       ;CHK OACT = 1
6749  033312  000001                          1
6750  033314  004737  004662                  JSR     PC,OSIRDY       ;CHK ORDY = 1
6751  033320  000001                          1
6752  033322  005303                          DEC     R3              ;DECR COUNTER
6753  033324  001332                          BNE     4$              ;BR IF NOT DONE YET
6754  033326  004737  006430                  JSR     PC,ISIRDY       ;CHK IRDY = 0
6755  033332  000000                          0
6756  033334  005737  002430                  TST     CHPTYP          ;SEE IF SIG USYRT
6757  033340  001007                          BNE     11$             ;BR IF NOT
6758  033342  105037  002374                  CLRB    WAX15
6759  033346  112737  000002  002376          MOVB    #TEOM,WAX16     ;LOAD EOM CHAR
6760  033354  004737  004312                  JSR     PC,WRITAX       ;LOAD ANOTHER CHAR INTO USYRT TX BUFFER
```

```
6761  033360  004737  005254          11$:    JSR     PC,STPLU        ;CLOCK LU FOR 3 CYCLES
6762  033364  000003                          3
6763  033366  004737  006430                  JSR     PC,ISIRDY       ;CHK IRDY = 1
6764  033372  000002                          2
6765  033374  004737  005352                  JSR     PC,OACTIV       ;CHK OACT = 1
6766  033400  000001                          1
6767  033402  004737  006714                  JSR     PC,IACTIV       ;CHK IACT = 1
6768  033406  000001                          1
6769  033410  004737  007102                  JSR     PC,RSEOM        ;CHK RSOM = 1, REOM = 0
6770  033414  000001                          1
6771  033416  004737  006430                  JSR     PC,ISIRDY       ;CHK IRDY = 0
6772  033422  000000                          0
6773  033424  012737  000000  002402          MOV     #0,AXNUM        ;SET AX BYTE NO. FOR AX0
6774  033432  123727  002370  000000          CMPB    RAX15,#000      ;COMPARE RCV'D CHAR TO 000
6775  033440  001415                          BEQ     9$              ;BR IF MATCH
6776  033442  012737  000000  002404          MOV     #0,GOODAT       ;SET EXPECTED DATA
6777  033450  013737  002370  002406  6$:     MOV     RAX15,BADDAT    ;SET ACTUAL DATA
6778  033456  004737  004526                  JSR     PC,GETALL       ;GET REGS FOR PRINTOUT
6779                                  ;REPORT INCORRECT DATA CHAR RCV'D
6780  033462                                  ERRDF   26,EM26,ERR3
  (4) 033462  104455                                                                TRAP    C$ERDF
  (5) 033464  000032                                                                .WORD   26
  (5) 033466  013071                                                                .WORD   EM26
  (5) 033470  015142                                                                .WORD   ERR3
6781  033472  000511                          BR      18$
6782  033474  004737  005254          9$:     JSR     PC,STPLU        ;CLOCK LU FOR 8 CYCLES
6783  033500  000010                          8.
6784  033502  004737  006430                  JSR     PC,ISIRDY       ;CHK IRDY = 1
6785  033506  000002                          2
6786  033510  004737  005352                  JSR     PC,OACTIV       ;CHK OACT = 1
6787  033514  000001                          1
6788  033516  004737  006714                  JSR     PC,IACTIV       ;CHK IACT = 1
6789  033522  000001                          1
6790  033524  004737  007102                  JSR     PC,RSEOM        ;CHK RSOM = 0, REOM = 0
6791  033530  000000                          0
6792  033532  004737  006430                  JSR     PC,ISIRDY       ;CHK IRDY = 0
6793  033536  000000                          0
6794  033540  123727  002370  000125          CMPB    RAX15,#125      ;COMPARE 2ND RCV'D CHAR TO 125
6795  033546  001404                          BEQ     12$             ;BR IF MATCH
6796  033550  012737  000125  002404          MOV     #125,GOODAT     ;SET EXPECTED DATA
6797  033556  000734                          BR      6$              ;BR TO REPORT ERROR
6798  033560  004737  005254          12$:    JSR     PC,STPLU        ;CLOCK LU FOR 8 CYCLES
6799  033564  000010                          8.
6800  033566  004737  006430                  JSR     PC,ISIRDY       ;CHK IRDY = 1
6801  033572  000002                          2
6802  033574  004737  005352                  JSR     PC,OACTIV       ;CHK OACT = 1
6803  033600  000001                          1
6804  033602  004737  006714                  JSR     PC,IACTIV       ;CHK IACT = 0
6805  033606  000000                          0
6806  033610  004737  007102                  JSR     PC,RSEOM        ;CHK RSOM = 0, REOM = 1
6807  033614  000002                          2
6808  033616  004737  006430                  JSR     PC,ISIRDY       ;CHK IRDY = 0
6809  033622  000000                          0
6810  033624  123727  002370  000252          CMPB    RAX15,#252      ;COMPARE 3RD RCV'D CHAR TO 252
6811  033632  001404                          BEQ     14$             ;BR IF MATCH
6812  033634  012737  000252  002404          MOV     #252,GOODAT     ;SET EXPECTED DATA
```

```
 6813  033642  000702                          BR      6$                      ;BR TO REPORT ERROR
 6814  033644  012737  000014  002400  14$:    MOV     #14,REGNUM              ;SET REG NO. = 14
 6815  033652  012737  000040  002366          MOV     #DISSI,WRIBYT
 6816  033660  004737  003750                  JSR     PC,WRITLU               ;CLEAR TX ENABLE
 6817  033664  012737  000011  002400          MOV     #11,REGNUM              ;SET REG NO. = 11
 6818  033672  012737  000200  002366          MOV     #OC,WRIBYT
 6819  033700  004737  003750                  JSR     PC,WRITLU               ;SET OC TO SHUT DOWN TRANSMITTER
 6820  033704  004737  005146                  JSR     PC,WAIT50               ;WAIT FOR SHUTDOWN
 6821  033710  004737  005352                  JSR     PC,OACTIV               ;CHK FOR OACT = 0
 6822  033714  000000                          0
 6823  033716  005037  002426          18$:    CLR     DISILO                  ;CLEAR DISABLE SILO FLAG
 6824  033722  004737  003576                  JSR     PC,MSTCLR               ;ISSUE MASTER CLEAR TO CLEAN UP
 6825  033726                          ENDTST
   (3) 033726                                                                  L10067:
   (3) 033726  104401                                                                  TRAP    C$ETST
 6826
 6827
 6828
 6829
 6830
 6831                                  ;;*****************************************************************************
 6832                                  .SBTTL      TEST 36 - RECEIVER BUFFER TEST - CHAR MODE, CRC
 6833                                  ;*
 6834                                  ;* FIRST, A MASTER CLEAR IS DONE AND THE PROGRAM CHECKS FOR ICIR = 1 AND IRDY
 6835                                  ;* = 0. THEN, 2 SOM CHARS ARE LOADED AND CLOCKED INTO THE USYRT, AND 64
 6836                                  ;* BYTES OF A 256-BYTE BINARY COUNT DATA PATTERN (000-377) ARE LOADED INTO
 6837                                  ;* THE TX SILO.
 6838                                  ;* THE LINE UNIT IS THEN CLOCKED UNTIL IRDY = 1, AND THE PROGRAM CHECKS FOR
 6839                                  ;* THIS TO OCCUR WITHIN 40-43 CYCLES. THE PROGRAM READS THE RCV SILO, CHECKS THE
 6840                                  ;* CHAR FOR 000, AND CHECKS FOR IRDY = 0 AGAIN.
 6841                                  ;* THE LINE UNIT IS THEN CLOCKED IN GROUPS OF 8 CYCLES, AND AFTER EACH, THE
 6842                                  ;* PROGRAM CHECKS FOR ICIR = 1, IRDY = 1, UNTIL THE 64TH GROUP, AFTER WHICH
 6843                                  ;* IT CHECKS FOR ICIR = 0, IRDY = 1. THE SECOND DATA CHAR IS READ FROM THE
 6844                                  ;* RECEIVER SILO AND COMPARED TO 001. THEN, THE PROGRAM CHECKS FOR ICIR = 1,
 6845                                  ;* IRDY = 1 AGAIN.
 6846                                  ;* THE REST OF THE BINARY COUNT DATA BYTES ARE CYCLED 8 CLOCKS AND READ AND
 6847                                  ;* COMPARED A BYTE AT A TIME.
 6848                                  ;;*****************************************************************************
 6849  033730                          BGNTST
   (3) 033730                                                                  T36::
 6850  033730  012737  034204  002362          MOV     #A10,RETADR             ;SET TEST EXIT ADDRESS FOR ERRORS
 6851                                  ;-----------------------------------------------------------------------------
 6852                                  ; DO MASTER CLR, CHK FOR ICIR = 1, IRDY = 0
 6853                                  ;-----------------------------------------------------------------------------
 6854  033736  004737  003576                  JSR     PC,MSTCLR               ;ISSUE MASTER CLEAR
 6855  033742  004737  006430                  JSR     PC,ISIRDY               ;CHK ICIR = 1, IRDY = 0
 6856  033746  000001                          1
 6857                                  ;-----------------------------------------------------------------------------
 6858                                  ; LOAD AND CLOCK 2 SOM'S, LOAD 64 BYTES OF BINARY COUNT PATTERN INTO TX SILO,
 6859                                  ; CLOCK LINE UNIT, CHK FOR IRDY = 1 WITHIN 40-43 CYCLES
 6860                                  ;-----------------------------------------------------------------------------
 6861  033750  004737  005540                  JSR     PC,INITRN               ;LOAD 2 SOM'S, CLOCK THEM INTO USYRT
 6862  033754  000226                          SYNCH
 6863  033756  000011                          STRIP!DDCMP
 6864  033760  005003                          CLR     R3                      ;INIT BINARY COUNT DATA FOR WRITING
 6865  033762  010337  002422          2$:     MOV     R3,TXWORD
```

```
6866  033766  004737  005174                JSR     PC,LDTXSI       ;LOAD A DATA BYTE INTO TX SILO
6867  033772  005203                        INC     R3              ;INCR DATA
6868  033774  020327  000100                CMP     R3,#64.         ;SEE IF 64 BYTES LOADED YET
6869  034000  002770                        BLT     2$              ;BR IF NOT YET
6870  034002  004737  007434                JSR     PC,RCV1ST       ;RECEIVE AND TIME FIRST CHARACTER
6871  034006  000050                        40.
6872                                ;-------------------------------------------------------------
6873                                ; READ RCV SILO, COMPARE FIRST CHAR TO 000, CHK FOR ICIR = 1, IRDY = 0
6874                                ;-------------------------------------------------------------
6875  034010  005004                9$:     CLR     R4              ;INIT PATTERN FOR READING
6876  034012  004737  007750                JSR     PC,CKDATA       ;READ RCV SILO, COMPARE DATA
6877  034016  000000                        0                       ;EXPECTED DATA = 000
6878  034020  000000                        0                       ;DON'T CLOCK LINE UNIT
6879  034022  005204                16$:    INC     R4              ;INCR DATA FOR READING
6880  034024  004737  006430                JSR     PC,ISIRDY       ;CHK FOR ICIR = 1, IRDY = 0
6881  034030  000001                        1
6882                                ;-------------------------------------------------------------
6883                                ; CLOCK 63 CHARS INTO RCV SILO, CHK ICIR = 1, IRDY = 1
6884                                ;-------------------------------------------------------------
6885  034032  004737  005254                18$:    JSR     PC,STPLU        ;CLOCK LU FOR 8 CYCLES
6886  034036  000010                        8.
6887  034040  010337  002422                MOV     R3,TXWORD
6888  034044  004737  005174                JSR     PC,LDTXSI       ;LOAD ANOTHER WORD INTO TX SILO
6889  034050  005203                        INC     R3              ;INCR PATTERN FOR WRITING
6890  034052  004737  006430                JSR     PC,ISIRDY       ;CHK ICIR = 1, IRDY = 1
6891  034056  000003                        3
6892  034060  020327  000177                CMP     R3,#127.        ;SEE IF 63 MORE CHARS CLOCKED YET
6893  034064  002762                        BLT     18$             ;BR IF NOT YET
6894                                ;-------------------------------------------------------------
6895                                ; CLOCK 1 MORE CHAR INTO RCV SILO, CHK ICIR = 0, IRDY = 1
6896                                ;-------------------------------------------------------------
6897  034066  004737  005254                JSR     PC,STPLU        ;CLOCK LU FOR 8 CYCLES
6898  034072  000010                        8.
6899  034074  004737  006430                JSR     PC,ISIRDY       ;CHK ICIR = 0, IRDY = 1
6900  034100  000002                        2
6901                                ;-------------------------------------------------------------
6902                                ;READ, COMPARE, CLOCK REST OF DATA CHARS
6903                                ;-------------------------------------------------------------
6904  034102  010437  034112                20$:    MOV     R4,21$          ;SET EXPECTED DATA
6905  034106  004737  007750                JSR     PC,CKDATA       ;READ AND COMPARE DATA
6906  034112  000000                21$:    0                       ;EXPECTED SILO ENTRY GOES HERE
6907  034114  000000                        0                       ;DON'T CLOCK LINE UNIT
6908  034116  005204                22$:    INC     R4              ;INCR DATA PATTERN FOR READS
6909  034120  020427  000400                CMP     R4,#400         ;SEE IF ALL DONE READING YET
6910  034124  001427                        BEQ     32$             ;BR IF DONE READING
6911  034126  004737  006430                JSR     PC,ISIRDY       ;CHK ICIR = 1, IRDY = 1
6912  034132  000003                        3
6913  034134  004737  005254                JSR     PC,STPLU        ;CLOCK LU FOR 8 CYCLES
6914  034140  000010                        8.
6915  034142  020327  000377                CMP     R3,#377         ;SEE IF ALL CHARS LOADED INTO TX SILO YET
6916  034146  003007                        BGT     24$             ;BR IF YES
6917  034150  010337  002422                MOV     R3,TXWORD
6918  034154  004737  005174                JSR     PC,LDTXSI       ;LOAD ANOTHER CHAR INTO TX SILO
6919  034160  005203                        INC     R3              ;INCR DATA PATTERN FOR WRITING
6920  034162  000137  034102                JMP     20$
6921  034166  012737  001000  002422  24$:  MOV     #TXEOM,TXWORD
```

```
                        JSR     PC,LDTXSI       ;LOAD EOM INTO TX SILO
                        JMP     20$
                32$:
                A10:    JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR TO CLEAN UP
                ENDTST
                                                                L10070:
                                                                        TRAP    C$ETST

;;*************************************************************************************
.SBTTL      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.
;;*************************************************************************************
BGNTST
                                                                T37::
                        MOV     #24$,RETADR     ;SET TEST EXIT ADRS FOR ERRORS
                        JSR     PC,INITRN       ;DO MASTER CLR, LOAD 2 SOM'S
                        000
                        CRC2!CRC1!IDLE!DDCMP
                        MOV     #15.,R1         ;INIT COUNTER
                        CLR     TXWORD
                3$:     JSR     PC,LDTXSI       ;LOAD A 000 CHAR INTO TX SILO
                        DEC     R1              ;DECR COUNTER
                        BNE     3$              ;BR IF NOT DONE LOADING YET
                        JSR     PC,WAIT50       ;WAIT FOR SILO TO RIPPLE
                        MOV     #6,AXNUM        ;SET BYTE NO. = 6 FOR AX3
                        MOV     #000,WAX15      ;SET DATA FOR AX3-15 = 0
                        MOV     #RXLEN2!RXLEN0,WAX16 ;SET RCV LEN = 5
                        JSR     PC,WRITAX       ;LOAD AX3
                        JSR     PC,STPLU        ;CLK LU UNTIL TX'ING 1ST DATA CHAR
                        CHPCHK!10.
                        MOV     #RXLEN2!RXLEN1,WAX16 ;SET RCV LEN = 6
                        JSR     PC,WRITAX       ;LOAD AX3
                        JSR     PC,RCV1ST       ;CLOCK 5-BIT DATA CHAR
                        5
                        MOV     #RXLEN2!RXLEN1!RXLEN0,WAX16 ;SET RCV LEN = 7
                        JSR     PC,WRITAX       ;LOAD AX3
                        JSR     PC,RXCHAR       ;RCV 5-BIT DATA CHAR, CLK 6-BIT
                        6
                        MOV     #0,WAX16        ;SET RCV LEN = 8
                        JSR     PC,WRITAX       ;LOAD AX3
                        JSR     PC,RXCHAR       ;RCV 6-BIT DATA CHAR, CLK 7-BIT
                        7
                        JSR     PC,RXCHAR       ;RCV 7-BIT DATA CHAR, CLK 8-BIT
                        8.
```

```
 6975  034376  004737  011074                  JSR     PC,RXCHAR       ;RCV 8-BIT DATA CHAR
 6976  034402  000010                          8.
 6977  034404  004737  003576          24$:    JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR TO CLEAN UP
 6978  034410                          ENDTST
  (3)  034410                                                                  L10071:
  (3)  034410  104401                                                                 TRAP    C$ETST
 6979
 6980
 6981
 6982
 6983
 6984                                  ;;*************************************************************************
 6985                                  .SBTTL      TEST 38 - RECEIVER CHAR LENGTH TIMING TEST - BIT MODE, NO CRC
 6986                                  ;*
 6987                                  ;* THE LINE UNIT IS PLACED IN BIT MODE WITH NO ERROR DETECTION, AND A MESSAGE IS
 6988                                  ;* INITIATED  WITH 2 FLAG CHARS. NEXT, FIFTEEN 000 CHARS ARE LOADED INTO THE
 6989                                  ;* TRANSMITTER SILO. THE LINE UNIT IS THEN CLOCKED USING STEPLU WITH LULOOP
 6990                                  ;* SET, WHILE THE RCV CHAR LENGTH IS SET TO THE FOLLOWING VALUES : 8,8,8,7,6,5,
 6991                                  ;* 4,3,2,1. FOR EACH RCV CHAR LENGTH, THE PROGRAM CHECKS TO MAKE SURE THAT THE
 6992                                  ;* USYRT RECEIVER FLAGS OCCUR THE PROPER NO. OF CYCLES APART, FOR EACH RCV
 6993                                  ;* CHAR LENGTH. (FOR EXAMPLE, A 5 BIT CHAR TAKES 5 CLOCK CYCLES TO BE RECEIVED).
 6994                                  ;* A MASTER CLEAR IS THEN DONE TO TERMINATE THE OPERATION.
 6995                                  ;;*************************************************************************
 6996  034412                          BGNTST
  (3)  034412                                                                  T38::
 6997  034412  012737  034704  002362          MOV     #24$,RETADR     ;SET TEST EXIT ADRS FOR ERRORS
 6998  034420  004737  005540                  JSR     PC,INITRN       ;DO MASTER CLR, LOAD 2 SOM'S
 6999  034424  000000                          000
 7000  034426  000300                          CRC2!CRC1
 7001  034430  012701  000017                  MOV     #15.,R1         ;INIT COUNTER
 7002  034434  005037  002422                  CLR     TXWORD
 7003  034440  004737  005174          3$:     JSR     PC,LDTXSI       ;LOAD A 000 CHAR INTO TX SILO
 7004  034444  005301                          DEC     R1              ;DECR COUNTER
 7005  034446  001374                          BNE     3$              ;BR IF NOT DONE LOADING YET
 7006  034450  004737  005146                  JSR     PC,WAIT50       ;WAIT FOR SILO TO RIPPLE
 7007  034454  012737  000006  002402          MOV     #6,AXNUM        ;SET BYTE NO. = 6 FOR AX3
 7008  034462  012737  000000  002374          MOV     #000,WAX15      ;SET DATA FOR AX3-15 = 0
 7009  034470  004737  007434                  JSR     PC,RCV1ST       ;CLOCK FIRST 8-BIT DATA CHAR
 7010  034474  000040                          32.
 7011  034476  012737  000000  002376          MOV     #0,WAX16        ;SET RCV LEN = 8
 7012  034504  004737  004312                  JSR     PC,WRITAX       ;LOAD AX3
 7013  034510  004737  011074                  JSR     PC,RXCHAR       ;RCV FIRST 8-BIT DATA CHAR, CLK SECOND 8-BIT
 7014  034514  000010                          8.
 7015  034516  012737  000007  002376          MOV     #RXLEN2!RXLEN1!RXLEN0,WAX16 :SET RCV LEN = 7
 7016  034524  004737  004312                  JSR     PC,WRITAX       ;LOAD AX3
 7017  034530  004737  011074                  JSR     PC,RXCHAR       ;RCV SECOND 8-BIT DATA CHAR, CLK 3RD 8-BIT
 7018  034534  000010                          8.
 7019  034536  012737  000006  002376          MOV     #RXLEN2!RXLEN1,WAX16    ;SET RCV LEN = 6
 7020  034544  004737  004312                  JSR     PC,WRITAX       ;LOAD AX3
 7021  034550  004737  011074                  JSR     PC,RXCHAR       ;RCV 3RD 8-BIT DATA CHAR, CLK 7-BIT
 7022  034554  000007                          7
 7023  034556  012737  000005  002376          MOV     #RXLEN2!RXLEN0,WAX16    ;SET RCV LEN = 5
 7024  034564  004737  004312                  JSR     PC,WRITAX       ;LOAD AX3
 7025  034570  004737  011074                  JSR     PC,RXCHAR       ;RCV 7-BIT DATA CHAR, CLK 6-BIT
 7026  034574  000006                          6
 7027  034576  012737  000004  002376          MOV     #RXLEN2,WAX16   ;SET RCV LEN = 4
```

```
 7028  034604  004737  004312                JSR     PC,WRITAX       ;LOAD AX3
 7029  034610  004737  011074                JSR     PC,RXCHAR       ;RCV 6-BIT DATA CHAR, CLK 5-BIT
 7030  034614  000005                        5
 7031  034616  012737  000003  002376        MOV     #RXLEN1!RXLEN0,WAX16    ;SET RCV LEN = 3
 7032  034624  004737  004312                JSR     PC,WRITAX       ;LOAD AX3
 7033  034630  004737  011074                JSR     PC,RXCHAR       ;RCV 5-BIT DATA CHAR, CLR 4-BIT
 7034  034634  000004                        4
 7035  034636  012737  000002  002376        MOV     #RXLEN1,WAX16   ;SET RCV LEN = 2
 7036  034644  004737  004312                JSR     PC,WRITAX       ;LOAD AX3
 7037  034650  004737  011074                JSR     PC,RXCHAR       ;RCV 4-BIT DATA CHAR, CLK 3-BIT
 7038  034654  000003                        3
 7039  034656  012737  000001  002376        MOV     #RXLEN0,WAX16   ;SET RCV LEN = 1
 7040  034664  004737  004312                JSR     PC,WRITAX       ;LOAD AX3
 7041  034670  004737  011074                JSR     PC,RXCHAR       ;RCV 3-BIT DATA CHAR, CLK 2-BIT
 7042  034674  000002                        2
 7043  034676  004737  011074                JSR     PC,RXCHAR       ;RCV 2-BIT DATA CHAR, CLK 1-BIT
 7044  034702  000001                        1
 7045  034704  004737  003576        24$:    JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR TO CLEAN UP
 7046  034710                        ENDTST
  (3)  034710                                                                  L10072:
  (3)  034710  104401                                                                 TRAP    C$ETST
 7047
 7048
 7049
 7050
 7051
 7052                                ;;*************************************************************************************
 7053                                .SBTTL      TEST 39 - TRANSMITTER UNDERRUN ERROR, IDLE MARKING, CHAR MODE,NO CRC
 7054                                ;*
 7055                                ;* THE LINE UNIT IS PLACED IN CHAR MODE, AND THE IDLE BIT IS SET. THEN, A
 7056                                ;* MSG IS INITIATED, A 000 CHAR IS SENT, AND THE TX BUFFER IS NOT SERVICED
 7057                                ;* IN RESPONSE TO THE USYRT TX BUFFER EMPTY FLAG, WHICH CAUSES A TX UNDERRUN
 7058                                ;* ERROR. THEN, THE RECEIVER IS CLOCKED AND CHECKED FOR TWO 377 CHARS TO BE
 7059                                ;* RECEIVED (LINE MARKING) BEFORE SHUTTING DOWN WITH A MASTER CLEAR.
 7060                                ;;*************************************************************************************
 7061  034712                        BGNTST
  (3)  034712                                                                  T39::
 7062  034712  012737  034774  002362        MOV     #24$,RETADR     ;SET TEST EXIT ADDRESS FOR ERRORS
 7063  034720  004737  005540                JSR     PC,INITRN       ;MST CLR, LOAD 2 SOM'S
 7064  034724  000226                        SYNCH
 7065  034726  000341                        CRC2!CRC1!IDLE!DDCMP
 7066  034730  012737  000000  002422        MOV     #000,TXWORD
 7067  034736  004737  005174                JSR     PC,LDTXSI       ;LOAD 000 CHAR INTO TX SILO
 7068  034742  004737  005254                JSR     PC,STPLU        ;CLOCK LINE UNIT UNTIL LINE GOES MARKING
 7069  034746  000063                        51.
 7070  034750  004737  007354                JSR     PC,RDRXSI       ;READ 000 CHAR
 7071  034754  004737  007750                JSR     PC,CKDATA       ;READ AND CHECK FOR MARK CHAR (377)
 7072  034760  000377                        377
 7073  034762  000000                        000
 7074  034764  004737  007750                JSR     PC,CKDATA       ;READ AND CHECK FOR ANOTHER MARK CHAR
 7075  034770  000377                        377
 7076  034772  000000                        000
 7077  034774  004737  003576        24$:    JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR TO CLEAN UP
 7078  035000                        ENDTST
  (3)  035000                                                                  L10073:
  (3)  035000  104401                                                                 TRAP    C$ETST
```

```
                                ;;*************************************************************************
                                .SBTTL      TEST 40 - MSG TERMINATION WITH GA CHARS - BIT MODE,NO CRC
                                ;*
                                ;* THE DEVICE IS ENABLED FOR TRANSMIT AND RECEIVE, AND A MESSAGE IS
                                ;* INITIATED IN BIT MODE.
                                ;* 2 FLAG CHARACTERS ARE SENT, FOLLOWED BY
                                ;* THE FOLLOWING DATA CHARACTERS : 000, 125, 252, 377, 000. THEN THE LOOP
                                ;* MODE BIT (STRIP) IS SET AND 2 TERMINATING GO-AHEAD CHARACTERS ARE
                                ;* SENT. EACH USYRT RCV FLAG IS TIMED AS IT IS RECEIVED, AND THE 5 DATA
                                ;* WORDS ARE READ AND COMPARED TO EXPECTED VALUES.
                                ;* ALSO, THE FIRST GA CHAR IS CHECKED BY SCANNING THE TXDATA BIT AS THE GA
                                ;* IS BEING TRANSMITTED (GA = 376 OCTAL).
                                ;* THE TEST ALSO CHECKS FOR SETTING OF RAB AND EBLK
                                ;* IN LOOP MODE.
                                ;*************************************************************************
7099   035002                   BGNTST
 (3)   035002                                                                          T40::
7100   035002  012737  035136  002362          MOV     #24$,RETADR     ;SET TEST EXIT ADRS FOR ERRORS
7101   035010  004737  005540                  JSR     PC,INITRN       ;MST CLR, LOAD 2 SOM'S
7102   035014  000000                          000
7103   035016  000310                          CRC2!CRC1!STRIP
7104   035020  004737  011016                  JSR     PC,LODMSG       ;LOAD DATA CHARS INTO TX SILO
7105   035024  003224                          MSG1+4
7106   035026  000005                          5
7107   035030  012737  005000  002422          MOV     #TXGOA!TXEOM,TXWORD
7108   035036  004737  005174                  JSR     PC,LDTXSI       ;LOAD A GA CHAR INTO TX SILO
7109   035042  004737  005174                  JSR     PC,LDTXSI       ;LOAD ANOTHER GA
7110   035046  004737  005146                  JSR     PC,WAIT50       ;ALLOW SILO TO RIPPLE
7111   035052  004737  005254                  JSR     PC,STPLU        ;CLOCK LU UNTIL GA CHAR IS TX'ING
7112   035056  100071                          CHPCHK!57.
7113   035060  004737  011176                  JSR     PC,CKTBIT       ;SCAN TXDATA BIT FOR GA CHAR
7114   035064  000376                          376
7115   035066  004737  007750                  JSR     PC,CKDATA       ;RCV 000 CHAR, CLK 125
7116   035072  000000                          000
7117   035074  000000                          0
7118   035076  004737  007750                  JSR     PC,CKDATA       ;RCV 125 CHAR, CLK 252
7119   035102  000125                          125
7120   035104  000000                          0
7121   035106  004737  007750                  JSR     PC,CKDATA       ;RCV 252 CHAR, CLK 377
7122   035112  000252                          252
7123   035114  000000                          0
7124   035116  004737  007750                  JSR     PC,CKDATA       ;RCV 377 CHAR
7125   035122  000377                          377
7126   035124  000010                          8.
7127   035126  004737  007750                  JSR     PC,CKDATA       ;RCV 000 CHAR, CHK RAB = 1, EBLK = 1
7128   035132  003000                          3000
7129   035134  000010                          8.
7130   035136  004737  003576          24$:    JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR
7131
7132   035142                   ENDTST
 (3)   035142                                                                          L10074:
```

```
  (3)  035142  104401                                                                    !RAP    C$ETST
7133
7134
7135
7136
7137
7138                                ;;*************************************************************************
7139                                .SBTTL      TEST 41 - IDLE SYNCHS TEST - CHAR MODE
7140                                ;*
7141                                ;* THE DEVICE IS ENABLED FOR TRANSMIT AND RECEIVE, AND A MESSAGE IS
7142                                ;* INITIATED IN CHAR MODE. 24(DEC) SYNCHS ARE SENT.
7143                                ;* EACH SYNCH IS TIMED AS IT IS RECEIVED, AND THE BITS ARE CHECKED
7144                                ;* FOR A VALID SYNCH CHAR FOR EACH OF THE 22 SYNCHS WHICH FOLLOW
7145                                ;* THE FIRST TWO (THESE PERFORM SYNCHRONIZATION, AND ARE NOT READ).
7146                                ;* WHILE THE LAST SYNCH IS BEING TRANSMITTED, OC IS SET, AND THE
7147                                ;* NEXT CHAR RCV'D AFTER THE SYNCH IS CHECKED TO BE 377 (LINE MARKING).
7148                                ;* THEN, A MASTER CLEAR IS ISSUED.
7149                                ;* THE SYNCH CHAR USED IS 226 (OCTAL).
7150                                ;;*************************************************************************
7151  035144                        BGNTST
  (3)  035144                                                                                T41::
7152  035144  012737  035304  002362          MOV     #24$,RETADR     ;SET TEST EXIT ADRS FOR ERRORS
7153  035152  004737  005540                  JSR     PC,INITRN       ;MST CLR, LOAD 2 SOM'S
7154  035156  000226                          SYNCH
7155  035160  000341                          CRC2!CRC1!IDLE!DDCMP
7156  035162  012701  000026                  MOV     #22.,R1         ;INIT COUNTER
7157  035166  012737  000226  002422          MOV     #SYNCH,TXWORD
7158  035174  004737  005174          6$:     JSR     PC,LDTXSI       ;LOAD AN SOM INTO TX SILO
7159  035200  005301                          DEC     R1              ;DECR COUNTER
7160  035202  001374                          BNE     6$              ;BR IF MORE TO LOAD
7161  035204  004737  005146                  JSR     PC,WAIT50       ;ALLOW SILO TO RIPPLE
7162  035210  004737  007434                  JSR     PC,RCV1ST       ;CLK LU UNTIL 3RD SYNCH RCV'D (RCVR IS ACTIVE)
7163  035214  000030                          24.
7164  035216  012701  000025                  MOV     #21.,R1         ;INIT COUNTER
7165  035222  004737  007750          8$:     JSR     PC,CKDATA       ;READ A SYNCH, CLK NEXT ONE
7166  035226  000226                          SYNCH
7167  035230  000010                          8.
7168  035232  005301                          DEC     R1              ;DERC COUNTER
7169  035234  001372                          BNE     8$              ;BR IF NOT ALL CHECKED
7170  035236  004737  007750                  JSR     PC,CKDATA       ;CHECK LAST SYNCH
7171  035242  000226                          SYNCH
7172  035244  000004                          4
7173  035246  012737  000011  002400          MOV     #11,REGNUM      ;SET REG NO. = 11
7174  035254  112737  000200  002366          MOVB    #OC,WRIBYT
7175  035262  004737  003750                  JSR     PC,WRITLU       ;SET OC IN REG 11
7176  035266  004737  005254                  JSR     PC,STPLU        ;FINISH CLOCKING CHAR, AND THEN SOME
7177  035272  000014                          12.
7178  035274  004737  007750                  JSR     PC,CKDATA       ;RCV A MARK CHAR, CHK IT
7179  035300  000377                          377
7180  035302  000000                          0
7181  035304  004737  003576          24$:    JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR TO CLEAN UP
7182  035310                        ENDTST
  (3)  035310                                                                                L10075:
  (3)  035310  104401                                                                                !RAP    C$ETST
7183
7184
```

```
7185
7186
7187
7188                    ;;*************************************************************************
7189                    .SBTTL      TEST 42 - STRIP SYNCH TEST
7190                    ;*
7191                    ;* THE DEVICE IS ENABLED FOR TRANSMIT AND RECEIVE, AND A MESSAGE IS
```

```
                                        ;* INITIATED IN CHAR MODE AND WITH THE STRIP SYNCH
                                        ;* BIT SET. THEN 24 (DEC) SYNCHS ARE SENT
                                        ;* FOLLOWED BY THE FOLLOWING DATA CHARACTERS : 377, 000, 125, 252,
                                        ;* AND 2 TERMINATING SYNCHS.
                                        ;* EACH OF THE 23 SYNCHS AFTER THE FIRST ARE CHECKED AT THE TRANSMITTER OUTPUT,
                                        ;* BY SCANNING THE TXDATA BIT.
                                        ;* EACH USYRT RCV FLAG IS TIMED AS IT IS RECEIVED, AND THE 4 DATA WORDS
                                        ;* ARE READ AND COMPARED TO EXPECTED VALUES.
                                        ;* FINALLY, THE LINE UNIT IS CLOCKED FOR SEVERAL CHAR TIMES, AND A CHECK
                                        ;* IS MADE FOR OACT = 0 (TEOM SHOULD CAUSE TX ENABLE TO DROP).
                                        ;* THE ABOVE TEST IS REPEATED FOR EACH OF THE FOLLOWING SYNCH CHAR DATA
                                        ;* PATTERNS : 226,000,125,252,376,177.
                                        ;;*************************************************************************
035312                                  BGNTST
 (3)  035312                                                                    T42::
035312  012737  035532  002362          MOV     #24$,RETADR     ;SET TEST EXIT ADRS FOR ERRORS
035320  012701  035540                  MOV     #SYNPAT,R1      ;GET POINTER TO DATA
035324  011137  035334          2$:     MOV     (R1),3$         ;GET A SYNCH PATTERN
035330  004737  005540                  JSR     PC,INITRN       ;MST CLR, LOAD 2 SOM'S
035334  000000                  3$:     .WORD   0               ;SYNCH PATTERN GOES HERE
035336  000311                          CRC2!CRC1!STRIP!DDCMP
035340  012737  000400  002422          MOV     #TXSOM,TXWORD
035346  012702  000026                  MOV     #22.,R2         ;LOAD 22 SOM'S INTO TX SILO
035352  004737  005174          6$:     JSR     PC,LDTXSI
035356  005302                          DEC     R2
035360  001374                          BNE     6$
035362  004737  011016                  JSR     PC,LODMSG       ;LOAD DATA CHARS INTO TX SILO
035366  003246                          MSG4
035370  000006                          6
035372  012737  001000  002422          MOV     #TXEOM,TXWORD
035400  004737  005174                  JSR     PC,LDTXSI       ;LOAD A TEOM
035404  004737  005174                  JSR     PC,LDTXSI       ;LOAD ANOTHER TEOM
035410  004737  005146                  JSR     PC,WAIT50       ;ALLOW SILO TO RIPPLE
035414  011137  035436                  MOV     (R1),16$        ;GET CURRENT SYNCH PATTERN
035420  012702  000027                  MOV     #23.,R2         ;INIT COUNTER
035424  004737  005254                  JSR     PC,STPLU        ;CLOCK OUT FIRST SYNCH
035430  100010                          CHPCHK!8.
035432  004737  011176          14$:    JSR     PC,CKTBIT       ;CHECK TX'D SYNCH
035436  000000                  16$:    .WORD   0               ;SYNCH PATTERN GOES HERE
035440  005302                          DEC     R2              ;DECR COUNTER
035442  001373                          BNE     14$             ;BR IF NOT DONE CHECKING LAST 23 SYNCHS
035444  004737  007434                  JSR     PC,RCV1ST       ;CLOCK UNTIL 000 CHAR RCV'D
035450  000010                          8.
035452  004737  007750                  JSR     PC,CKDATA       ;RCV 377, CLOCK 000
035456  000377                          377
035460  000010                          8.
035462  004737  007750                  JSR     PC,CKDATA       ;RCV 000, CLK 125
035466  000000                          000
035470  000010                          8.
035472  004737  007750                  JSR     PC,CKDATA       ;RCV 125, CLK 252
035476  000125                          125
035500  000010                          8.
035502  004737  007750                  JSR     PC,CKDATA       ;RCV 252, CLK END OF MSG
035506  000252                          252
035510  000040                          32.
035512  004737  005352                  JSR     PC,OACTIV       ;CHK FOR OACT = 0
```

```
 7248  035516  000000                          0
 7249  035520  062701  000002                  ADD     #2,R1           ;INIT SYNCH PATTERN POINTER
 7250  035524  020127  035554                  CMP     R1,#SYNPAT+12.  ;SEE IF ALL PATTERNS CHECKED YET
 7251  035530  103675                          BLO     2$              ;BR IF NOT YET
 7252  035532  004737  003576          24$:    JSR     PC,MSTCLR       ;ISSUE MASTER CLEAR TO CLEAN UP
 7253  035536                          ENDTST
  (3)  035536                                                                  L10076:
  (3)  035536  104401                                                                 TRAP    C$ETST
 7254
 7255  035540  000226                  SYNPAT: 226
 7256  035542  000000                          000
 7257  035544  000125                          125
 7258  035546  000252                          252
 7259  035550  000376                          376
 7260  035552  000177                          177
 7261
 7262
 7263
 7264
 7265
```

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

035554                          BGNHRD
(3)  035554  000022                                                     .WORD L10077-L$HARD/2
(3)  035556                                                     L$HARD::
035556                          GPRMA   ADDRES,2,0,160000,177776,YES
(4)  035556  001031                                                     .WORD   T$CODE
(4)  035560  035622                                                     .WORD   ADDRES
(4)  035562  160000                                                     .WORD   T$LOLIM
(4)  035564  177776                                                     .WORD   T$HILIM
035566                          GPRMA   VECTOR,4,0,0,674,YES
(4)  035566  002031                                                     .WORD   T$CODE
(4)  035570  035650                                                     .WORD   VECTOR
(4)  035572  000000                                                     .WORD   T$LOLIM
(4)  035574  000674                                                     .WORD   T$HILIM
035576                          GPRMD   PRIRTY,6,0,7000,4,7,YES
(4)  035576  003032                                                     .WORD   T$CODE
(4)  035600  035701                                                     .WORD   PRIRTY
(4)  035602  007000                                                     .WORD   7000
(4)  035604  000004                                                     .WORD   T$LOLIM
(4)  035606  000007                                                     .WORD   T$HILIM
035610                          GPRMD   ISRUN,24,0,7,0,7,YES
(4)  035610  012032                                                     .WORD   T$CODE
(4)  035612  035732                                                     .WORD   ISRUN
(4)  035614  000007                                                     .WORD   7
(4)  035616  000000                                                     .WORD   T$LOLIM
(4)  035620  000007                                                     .WORD   T$HILIM

035622                          ENDHRD
(2)
(3)  035622                                                     .EVEN
                                                        L10077:

035622  042504  044526  042503  ADDRES: .ASCIZ  /DEVICE CSR ADDRESS : /
035630  041440  051123  040440
035636  042104  042522  051523
035644  035040  000040
035650  042504  044526  042503  VECTOR: .ASCIZ  /DEVICE VECTOR ADDRESS : /
035656  053040  041505  047524
035664  020122  042101  051104
035672  051505  020123  020072
035700     000
035701     104  053105  041511  PRIRTY: .ASCIZ  /DEVICE PRIORITY LEVEL : /
035706  020105  051120  047511
035714  044522  054524  046040
```

```
                035722  053105  046105  035040
                035730  000040
7292            035732  044515  051103  050117  ISRUN:  .ASCIZ  /MICROPROCESSOR RUN SWITCH - TYPE 0 IF OFF, 1 IF ON : /
                035740  047522  042503  051523
                035746  051117  051040  047125
                035754  051440  044527  041524
                035762  020110  020055  054524
                035770  042520  030040  044440
                035776  020106  043117  026106
                036004  030440  044440  020106
                036012  047117  035040  000040
7293                                            .EVEN
7294
7295
7296
7297
7298
7299
```

```
                        .SBTTL  SOFTWARE PARAMETER CODING SECTION


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

036020                          BGNSFT
(3) 036020  000000                                                      .WORD L10100-L$SOFT/2
(3) 036022                                                      L$SOFT::

036022                          ENDSFT
(2)
(3) 036022                                                              .EVEN
                                                                L10100:

                        .EVEN


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


036230                          ENDMOD

036230                          LASTAD
(2)
(4) 036230  000000                                                      .EVEN
(4) 036232  000000                                                      .WORD   0
(3) 036234                                                              .WORD   0
                        L$LAST::

            000001      .END
```

```
ABORT = 000004          2395#
ADDRES  035622          4441    4447    4462    4482    4500    4521    4539    4558    4577    7282    7289#
ADR   = 000020 G        2354#
ANBITS  002561          2794#   5473    5474    5524    5525    5571    5572
APA   = 000200          2573#
ASBC0 = 000020          2530#
ASBC1 = 000040          2529#
ASBC2 = 000100          2528#
ASSEMB= 000010          2211
AXNUM   002402          2715#   3367    3405    3418    3443    3445    3451*   3457*   3458    3460*   3462    3653    3661*
                        3704*   3900    3906*   3935*   3941*   4183    4185*   4194*   4203*   5330*   5342*   5346*   5356
                        5368*   5379*   5407*   5414*   5416    5428*   5470*   5485*   5521*   5536*   5568*   5583*   5628*
                        5646*   5683*   5763*   5774*   5879*   6186*   6253*   6363*   6443*   6526*   6589*   6668*   6717*
                        6773*   6955*   7007*
AX0.15= 002322          2643#   3450    4471    4490    4510    4529    4547    4567
AX0.16= 002324          2644#   4471    4490    4510    4529    4547    4567
AX1   = 000001          2426#   2498#
AX1.15= 002326          2645#   4471    4490    4510    4529    4547    4567
AX1.16= 002330          2646#   4471    4490    4510    4529    4547    4567
AX2   = 000002          2425#   2497#
AX2.15= 002332          2647#   4473    4492    4512    4531    4549    4569
AX2.16= 002334          2648#   4473    4492    4512    4531    4549    4569
AX3.15= 002336          2649#   4473    4492    4512    4531    4549    4569
AX3.16= 002340          2650#   4473    4492    4512    4531    4549    4569
AX315U= 000372          2593#   5358    5418    5635
A1      024222          5246    5272    5291    5300    5310#
A10     034204          6850    6925#
A2      026630          5748    5787#
A3      027310          5812    5916    5920#
A4      027424          5942    5968#
A5      027534          5991    6014#
A6      027730          6039    6074#
A7      030274          6100    6116    6125    6138    6157    6161    6165#
A8      030510          6182    6222#
A9      031040          6240    6302#
BADDAT  002406          2717#   4072*   4073*   4094*   4095*   4450    4465    4504    4561    4834*   4868*   4899*   4932*
                        4968*   5010*   5062*   5098*   5133*   5167*   5202*   5266*   5285*   5304*   5363*   5374*   5423*
                        5433*   5480*   5490*   5531*   5540*   5578*   5587*   5641*   5651*   5699*   5722*   5769*   5779*
                        5884*   5907*   6385*   6400*   6483*   6548*   6629*   6673*   6777*
BCC   = 000001          2474#   4098    4100    4106
BCCCHK= 100000          2658#   4096
BIT0  = 000001 G        2354#   2376    2388    2397    2426    2438    2450    2462    2474    2486    2498    2510    2522
                        2534    2546    2555    2567    2580    2592    2603    2675    3445    3486    3615    3827    3868
                        3908    4278    4669
BIT00 = 000001 G        2354#
BIT01 = 000002 G        2354#
BIT02 = 000004 G        2354#
BIT03 = 000010 G        2354#
BIT04 = 000020 G        2354#
BIT05 = 000040 G        2354#
BIT06 = 000100 G        2354#
BIT07 = 000200 G        2354#
BIT08 = 000400 G        2354#
BIT09 = 001000 G        2354#
BIT1  = 000002 G        2354#   2375    2387    2396    2415    2425    2437    2449    2461    2473    2485    2497    2509
                        2521    2533    2545    2554    2566    2579    2591    2602    2676    3502    3811    3922
```

```
BIT10 = 002000 G    2354#  2613  2625
BIT11 = 004000 G    2354#  2612  2624
BIT12 = 010000 G    2354#
BIT13 = 020000 G    2354#
BIT14 = 040000 G    2354#
BIT15 = 100000 G    2354#  2656  2658  2659  3583  3737
BIT2  = 000004 G    2354#  2374  2386  2395  2414  2424  2436  2448  2460  2472  2484  2496  2508
                    2520   2532  2544  2553  2565  2578  2590  2601
BIT3  = 000010 G    2354#  2373  2385  2394  2413  2423  2435  2447  2459  2471  2483  2495  2507
                    2519   2531  2543  2552  2564  2577  2589
BIT4  = 000020 G    2354#  2372  2384  2412  2422  2434  2446  2458  2470  2482  2494  2506  2518
                    2530   2542  2563  2576  2588
BIT5  = 000040 G    2354#  2383  2404  2411  2421  2433  2445  2457  2469  2481  2493  2505  2517
                    2529   2541  2562  2575  2587  2600
BIT6  = 000100 G    2354#  2371  2382  2403  2410  2420  2432  2444  2456  2468  2480  2492  2504
                    2516   2528  2540  2561  2574  2586  2599
BIT7  = 000200 G    2354#  2370  2381  2393  2402  2409  2431  2443  2455  2467  2479  2491  2503
                    2515   2527  2539  2551  2560  2573  2585  2598  4066  4067
BIT8  = 000400 G    2354#  2615  2627
BIT9  = 001000 G    2354#  2614  2626
BOE   = 000400 G    2354#
BPOLL = 000100      2403#
BSEL1   002450      2736#  3231*  3233*  3234*  3248*  3249*  3254*  3346*  3348*  3449*  3587*  3588*  3590*
                    3680*  3681*  3686*  3699*  4684*  4685*  4686   4921*  5623*
BSEL2   002452      2737#  4686*  4687*  5259   5279   5298
BSEL4   002454      2738#  3284   3305*  4960*
CARR  = 000001      2486#
CHPCHK= 100000      2656#  5948   5997   6048   6106   6148   6193   6246   6330   6960   7112   7228
CHPTYP  002430      2726#  3584   3694*  3698*  3738   4638*  6734   6756
CKDATA  007750      4057#  6876   6905   7071   7074   7115   7118   7121   7124   7127   7165   7170   7178
                    7235   7238   7241   7244
CKTBIT  011176      4274#  6332   7113   7229
CRCCHK= 100000      2659#  4329
CRCTY0= 000001      2580#
CRCTY1= 000002      2579#
CRCTY2= 000004      2578#
CRC1  = 000100      2432#  6042   6522   6585   6704   6948   7000   7065   7103   7155   7212
CRC2  = 000200      2431#  6042   6522   6585   6704   6948   7000   7065   7103   7155   7212
CS    = 000004      2484#
C$AU  = 000052      2211#  4780
C$AUTO= 000061      2211#  4725
C$BRK = 000022      2211#
C$BSEG= 000004      2211#  4859   5090   5124   5159   5194   5469   5520   5567   5627   5689
C$BSUB= 000002      2211#  5687   5713   5749
C$CEFG= 000045      2211#
C$CLCK= 000062      2211#
C$CLEA= 000012      2211#  4742
C$CLOS= 000035      2211#
C$CLP1= 000006      2211#
C$CVEC= 000036      2211#
C$DCLN= 000044      2211#
C$DODU= 000051      2211#  4722
C$DRPT= 000024      2211#
C$DU  = 000053      2211#  4761
C$EDIT= 000003      2211#  2251
C$ERDF= 000055      2211#  3492   3498   3508   3514   3621   3627   3785   3817   3823   3833   3839   3874
```

```
                    3880  3914  3920  3928  3934  4080  4085  4104  4110  4119  4125  4135  4141
                    4150  4156  4289  4295  4811  4837  4871  4902  4935  4971  5013  5065  5101
                    5136  5170  5205  5269  5288  5307  5340  5354  5366  5377  5426  5436  5483
                    5493  5534  5543  5581  5590  5644  5654  5702  5725  5772  5782  5887  5910
                    6072  6115  6124  6137  6156  6164  6388  6403  6486  6551  6632  6676  6780
C$ERHR= 000056       2211#
C$ERRO= 000060       2211#
C$ERSF= 000054       2211#
C$ERSO= 000057       2211#
C$ESCA= 000010       2211#  5014  5066  5341  5355  5367  5378  5427  5437  5484  5535  5582  5645
                     5773   5783  5888  5911
C$ESEG= 000005       2211#  4873  5103  5138  5172  5207  5495  5545  5592  5656  5704
C$ESUB= 000003       2211#  5709  5727  5788
C$ETST= 000001       2211#  4814  4839  4877  4904  4937  4973  5019  5073  5107  5142  5176  5211
                     5312   5383  5444  5499  5549  5596  5661  5728  5789  5921  5970  6016  6076
                     6166   6223  6303  6338  6418  6501  6564  6647  6679  6825  6926  6978  7046
                     7078   7132  7182  7253
C$EXIT= 000032       2211#
C$GETB= 000026       2211#
C$GETW= 000027       2211#
C$GMAN= 000043       2211#
C$GPHR= 000042       2211#  4676
C$GPLO= 000030       2211#
C$GPRI= 000040       2211#
C$INIT= 000011       2211#  4699
C$INLP= 000020       2211#
C$MANI= 000050       2211#
C$MEM = 000031       2211#
C$MSG = 000023       2211#  4442  4455  4474  4493  4513  4532  4550  4570  4584
C$OPEN= 000034       2211#
C$PNTB= 000014       2211#  4441  4447  4448  4449  4450  4462  4463  4464  4465  4481  4482  4483
                     4484   4500  4501  4502  4503  4504  4520  4521  4522  4523  4539  4540  4541
                     4557   4558  4559  4560  4561  4577  4578  4579
C$PNTF= 000017       2211#  4760  5245  5271  5290  5309
C$PNTS= 000016       2211#
C$PNTX= 000015       2211#  4451  4452  4453  4454  4466  4467  4468  4469  4470  4471  4472  4473
                     4485   4486  4487  4488  4489  4490  4491  4492  4505  4506  4507  4508  4509
                     4510   4511  4512  4524  4525  4526  4527  4528  4529  4530  4531  4542  4543
                     4544   4545  4546  4547  4548  4549  4562  4563  4564  4565  4566  4567  4568
                     4569   4580  4581  4582  4583
C$QIO = 000377       2211#
C$RDBU= 000007       2211#
C$REFG= 000047       2211#  4650  4653  4656  4659
C$RESE= 000033       2211#  4758  4920
C$REVI= 000003       2211#  2251
C$RFLA= 000021       2211#
C$RPT = 000025       2211#  4601
C$SEFG= 000046       2211#
C$SPRI= 000041       2211#  4715  4803
C$SVEC= 000037       2211#
C$TPRI= 000013       2211#
C32BCC= 000040       2587#  2593  5636
C32ENB= 000004       2590#
DDC   = 000100       2574#
DDCMP = 000001       2438#  2510#  5945  6042  6103  6145  6185  6321  6359  6522  6863  6948  7065
                     7155   7212
```

```
DEVMAP  002434          2728#  4665*  4680*
DEVPTR  002436          2729#  4669*  4678*  4680   4681*
DFPTBL  002252 G        2296#
DH1     014266          4424#  4449   4484   4541   4560   4579
DH2     014310          4425#  4451   4466   4485   4505   4524   4542   4562   4580
DH3     014337          4426#  4451   4466   4485   4505   4524   4542   4562   4580
DH4     014375          4427#  4453   4468   4487   4507   4526   4544   4564   4582
DH5     014437          3444   4428#
DH6     014442          3447   4429#
DH7     014445          4430#  4470   4489   4509   4528   4546   4566
DH8     014477          4431#  4470   4489   4509   4528   4546   4566
DH9     014536          4432#  4472   4491   4511   4530   4548   4568
DIAGMC= 000000          2211
DISILO  002426          2725#  3370   3407   3421   4637*  6665*  6677*  6710*  6823*
DISSI = 000040          2421#  2493#  6663   6665   6708   6710   6815
DTR   = 000100          2410#  2480#
EBLK  = 000002          2473#  4113   4115   4121
EF.CON= 000036 G        2354#  4659
EF.NEW= 000035 G        2354#  4656
EF.PWR= 000034 G        2354#
EF.RES= 000037 G        2354#  4653
EF.STA= 000040 G        2354#  4650
EM1     012127          4365#  4811
EM10    012451          3514   4374#
EM11    012472          3621   4375#
EM12    012507          3627   4376#
EM13    012530          4377#  6137
EM14    012560          4378#  6124   6156
EM15    012575          4379#  6164
EM16    012624          4380#  6115
EM17    012645          3817   4381#
EM18    012662          3823   4382#
EM19    012703          3833   4383#
EM2     012163          4366#  4837   4902   5013   5366   5377   5725
EM20    012720          3839   4384#
EM21    012741          3874   4385#
EM22    012756          3880   4386#
EM23    012777          4387#
EM24    013020          4388#
EM25    013035          4389#
EM26    013071          4390#  6388   6486   6551   6632   6780
EM27    013123          4391#  6403
EM28    013154          3920   4392#
EM29    013175          3914   4393#
EM3     012222          4367#  4871   4971   5065   5101   5136   5170   5205   5426   5436   5483   5493   5534
                        5543   5581   5590   5644   5654   5702   5772   5782   5887   5910   6676
EM30    013212          3934   4394#
EM31    013233          3928   4395#
EM32    013250          4289   4396#
EM33    013277          4295   4397#
EM34    013322          4085   4398#
EM35    013350          4104   4399#
EM36    013370          4110   4400#
EM37    013404          4119   4401#
EM38    013425          4125   4402#
EM39    013442          4135   4403#
```

```
EM4     012241            4368#   4935
EM40    013462            4141    4404#
EM41    013476            4150    4405#
EM42    013517            4156    4406#
EM43    013534            4407#
EM44    013561            4408#
EM45    013606            4409#
EM46    013633            4410#
EM47    013666            4411#
EM48    013721            4412#
EM49    013754            4413#
EM5     012314            4369#   5269    5307
EM50    014013            4414#
EM51    014047            4415#
EM52    014107            4416#   5340
EM53    014150            4417#   5354
EM54    014210            4080    4418#
EM6     012345            4370#   5288
EM60    014232            4419#   6072
EM65    014246            3785    4420#
EM7     012376            3492    4371#
EM8     012413            3498    4372#
EM9     012434            3508    4373#
ENAX  = 000004            2424#   2496#   3369    3420
ENDIT   021466            4660    4698#
ENDPAT  003220            3135#
ENDTRN  006274            3767#   5967    6013    6073    6221    6301
EOM   = 000002            2396#
ERRFLG  002356            2705#
ERROR1  002420            2722#   3365*   3378*   3403*   3429*   4639*   5335    5349
ERR1    014602  G         4440#   4811
ERR2    014634  G         4446#   4837    4871    4902    4935    4971    5013    5065    5101    5136    5170    5205    5269
                          5288    5307
ERR3    015142  G         4461#   5366    5377    5426    5436    5483    5493    5534    5543    5581    5590    5644    5654
                          5725    5772    5782    5887    5910    6388    6403    6486    6551    6632    6676    6780
ERR4    015624  G         3492    3498    3508    3514    3621    3627    3785    3817    3823    3833    3839    3874    3880
                          4080    4289    4295    4480#
ERR5    016302  G         4499#   5702
ERR6    017014  G         3914    3920    3928    3934    4519#
ERR7    017472  G         4538#   6072    6115    6124    6137    6156    6164
ERR8    020124  G         4085    4104    4110    4119    4125    4135    4141    4150    4156    4556#
ERR9    020632  G         4576#   5340    5354
EVL   = 000004  G         2354#
E$END = 002100            2211#
E$LOAD= 000035            2211#   2251
FMT1    011454            4349#   4441    4447    4462    4482    4500    4521    4539    4558    4577
FMT10   011717            4358#   4481    4520    4557
FMT11   011750            4359#   4501
FMT19   012007            4360#   5245
FMT2    011464            4350#   4448    4463    4483    4502    4522    4540    4559    4578
FMT24   012040            4361#   5271    5290    5309
FMT27   021602            4760    4763#
FMT3    011506            4351#   4450    4465    4504    4561
FMT4    011550            4352#   4451    4466    4470    4485    4489    4505    4509    4524    4528    4542    4546    4562
                          4566    4580
FMT5    011563            4353#   4452    4467    4471    4486    4490    4506    4510    4525    4529    4543    4547    4563
```

```
                    4567  4581
FMT6    011613      4354# 4454  4469  4473  4488  4492  4508  4512  4527  4531  4545  4549  4565
                    4569  4583
FMT7    011646      4355# 4449  4484  4541  4560  4579
FMT8    011656      4356# 4464  4503  4523
FMT9    011712      4357# 4453  4468  4472  4487  4491  4507  4511  4526  4530  4544  4548  4564
                    4568  4582
FRSTIM  002412      2719# 4641  4648*
F$AU  = 000015      2211# 4779  4780
F$AUTO= 000020      2211# 4713  4725
F$BGN = 000040      2211# 2217  4440  4446  4461  4480  4499  4519  4538  4556  4576  4599  4615
                    4633  4713  4739  4756  4779  4801  4814  4826  4839  4854  4859  4877  4888
                    4904  4915  4937  4953  4973  4990  5014  5019  5034  5066  5073  5085  5090
                    5107  5119  5124  5142  5154  5159  5176  5188  5194  5211  5238  5312  5328
                    5341  5355  5367  5378  5383  5399  5427  5437  5444  5465  5469  5484  5499
                    5516  5520  5535  5549  5563  5567  5582  5596  5621  5627  5645  5661  5678
                    5687  5689  5709  5713  5727  5728  5746  5749  5773  5783  5788  5789  5811
                    5888  5911  5921  5941  5970  5990  6016  6038  6076  6096  6166  6181  6223
                    6239  6303  6318  6338  6354  6418  6434  6501  6517  6564  6580  6647  6660
                    6679  6696  6825  6849  6926  6944  6978  6996  7046  7061  7078  7099  7132
                    7151  7182  7206  7253  7280  7313  7337
F$CLEA= 000007      2211# 4739  4742
F$DU  = 000016      2211# 4756  4761
F$END = 000041      2211# 2217  4442  4455  4474  4493  4513  4532  4550  4570  4584  4601  4699
                    4725  4742  4761  4780  4801  4814  4826  4839  4854  4873  4877  4888  4904
                    4915  4937  4953  4973  4990  5014  5019  5034  5066  5073  5085  5103  5107
                    5119  5138  5142  5154  5172  5176  5188  5207  5211  5238  5312  5328  5341
                    5355  5367  5378  5383  5399  5427  5437  5444  5465  5484  5495  5499  5516
                    5535  5545  5549  5563  5582  5592  5596  5621  5645  5656  5661  5678  5687
                    5704  5709  5713  5727  5728  5746  5749  5773  5783  5788  5789  5811  5888
                    5911  5921  5941  5970  5990  6016  6038  6076  6096  6166  6181  6223  6239
                    6303  6318  6338  6354  6418  6434  6501  6517  6564  6580  6647  6660  6679
                    6696  6825  6849  6926  6944  6978  6996  7046  7061  7078  7099  7132  7151
                    7182  7206  7253  7287  7316  7337
F$HARD= 000004      2211# 7280  7287
F$HW  = 000013      2211# 2296  2310
F$INIT= 000006      2211# 4633  4699
F$JMP = 000050      2211#
F$MOD = 000000      2211# 2217  7337
F$MSG = 000011      2211# 4440  4442  4446  4455  4461  4474  4480  4493  4499  4513  4519  4532
                    4538  4550  4556  4570  4576  4584
F$PROT= 000021      2211# 4615  4619
F$PWR = 000017      2211#
F$RPT = 000012      2211# 4599  4601
F$SEG = 000003      2211# 4859  4873  5090  5103  5124  5138  5159  5172  5194  5207  5469  5495
                    5520  5545  5567  5592  5627  5656  5689  5704
F$SOFT= 000005      2211# 7313  7316
F$SRV = 000010      2211#
F$SUB = 000002      2211# 5687  5709  5713  5727  5749  5788
F$SW  = 000014      2211# 2324  2327
F$TEST= 000001      2211# 4801  4814  4826  4839  4854  4877  4888  4904  4915  4937  4953  4973
                    4990  5019  5034  5073  5085  5107  5119  5142  5154  5176  5188  5211  5238
                    5312  5328  5383  5399  5444  5465  5499  5516  5549  5563  5596  5621  5661
                    5678  5728  5746  5789  5811  5921  5941  5970  5990  6016  6038  6076  6096
                    6166  6181  6223  6239  6303  6318  6338  6354  6418  6434  6501  6517  6564
                    6580  6647  6660  6679  6696  6825  6849  6926  6944  6978  6996  7046  7061
```

```
                    7078    7099    7132    7151    7182    7206    7253
GETALL  004526      3442#   3490    3496    3506    3512    3619    3625    3783    3815    3821    3831    3837    3872
                    3878    3912    3918    3926    3932    4078    4083    4102    4108    4117    4123    4133    4139
                    4148    4154    4287    4293    5364    5375    5424    5434    5481    5491    5532    5541    5579
                    5588    5642    5652    5700    5723    5770    5780    5885    5908    6070    6113    6122    6135
                    6154    6162    6386    6401    6484    6549    6630    6674    6778
GETPRM  021310      4661    4672#   4679
GETREG  004016      3319#   3448    4835    4869    4900    4933    4969    5011    5063    5099    5134    5168    5203
                    5267    5286    5305    5338    5352
GOAH  = 000010      2394#
GOODAT  002404      2716#   4070*   4071*   4092*   4093*   4450    4465    4504    4561    4832*   4833*   4867*   4897*
                    4898*   4930*   4931*   4966*   4967*   5008*   5009*   5060*   5061*   5097*   5132*   5166*   5201*
                    5265*   5284*   5303*   5361*   5362*   5372*   5373*   5421*   5422*   5431*   5432*   5479*   5488*
                    5489*   5530*   5539*   5577*   5586*   5639*   5640*   5649*   5650*   5697*   5698*   5720*   5721*
                    5767*   5768*   5777*   5778*   5883*   5906*   6384*   6399*   6409*   6482*   6547*   6628*   6672*
                    6776*   6796*   6812*
G$CNTO= 000200      2211#
G$DELM= 000372      2211#
G$DISP= 000003      2211#
G$EXCP= 000400      2211#
G$HILI= 000002      2211#
G$LOLI= 000001      2211#
G$NO  = 000000      2211#
G$OFFS= 000400      2211#   7282    7283    7284    7285
G$OFSI= 000376      2211#   7282    7283    7284    7285
G$PRMA= 000001      2211#   7282    7283
G$PRMD= 000002      2211#   7284    7285
G$PRML= 000000      2211#
G$RADA= 000140      2211#
G$RADB= 000000      2211#
G$RADD= 000040      2211#
G$RADL= 000120      2211#
G$RADO= 000020      2211#   7282    7283    7284    7285
G$XFER= 000004      2211#
G$YES = 000010      2211#   7282    7283    7284    7285
HDX   = 000020      2412#   2482#
HELP  = 000001      2197#   2243    2253    2276    3204
HOE   = 100000 G    2354#
IACT  = 000100      2468#   3870    3876
IACTIV  006714      3860#   3987    4008    6374    6379    6394    6407    6415    6454    6463    6470    6475    6492
                    6498    6537    6542    6557    6561    6600    6609    6616    6621    6638    6644    6742    6767
                    6788    6804
IBE   = 010000 G    2354#
IC    = 000200      2402#   2467#   6496    6559    6642
ICIR  = 000010      2507#   3829    3835
IDL   = 000010      2577#
IDLE  = 000040      2433#   6145    6185    6948    7065    7155
IDU   = 000040 G    2354#
IER   = 020000 G    2354#
IERR  = 000002      2437#   4032    4038    6359    6439    6522    6585    6704
INITRN  005540      3651#   5943    5992    6040    6101    6143    6183    6241    6319    6698    6861    6946    6998
                    7063    7101    7153    7210
INTFLG  002354      2703#
INTGRL= 000010      2589#   2593
IRDY  = 000020      2470#   3813    3819    3998
ISIRDY  006430      3803#   3989    4002    4006    4010    4250    4256    6754    6763    6771    6784    6792    6800
```

```
                    6808    6855    6880    6890    6899    6911
ISR    = 000100 G   2354#
ISRUN    035732     7285    7292#
IXE    = 004000 G   2354#
I$AU   = 000041     2211#   4779#   4780#
I$AUTO= 000041      2211#   4713#   4725#
I$CLN  = 000041     2211#   4739#   4742#
I$DU   = 000041     2211#   4756#   4761#
I$HRD  = 000041     7280#   7287#
I$INIT= 000041      2211#   4633#   4699#
I$MOD  = 000041     2211#   2217#   7337#
I$MSG  = 000041     2211#   4440#   4442#   4446#   4455#   4461#   4474#   4480#   4493#   4499#   4513#   4519#   4532#
                    4538#   4550#   4556#   4570#   4576#   4584#
I$PROT= 000040      2211#   4615#
I$PTAB= 000041      2211#
I$PWR  = 000041     2211#
I$RPT  = 000041     2211#   4599#   4601#
I$SEG  = 000041     2211#   4801    4826    4854    4859#   4873#   4888    4915    4953    4990    5034    5085    5090#
                    5103#   5119    5124#   5138#   5154    5159#   5172#   5188    5194#   5207#   5238    5328    5399
                    5465    5469#   5484    5495#   5516    5520#   5535    5545#   5563    5567#   5582    5592#   5621
                    5627#   5645    5656#   5678    5687    5689#   5704#   5713    5746    5749    5811    5941    5990
                    6038    6096    6181    6239    6318    6354    6434    6517    6580    6660    6696    6849    6944
                    6996    7061    7099    7151    7206
I$SETU= 000041      2211#
I$SFT  = 000041     7313#   7316#
I$SRV  = 000041     2211#
I$SUB  = 000041     2211#   4801    4826    4854    4888    4915    4953    4990    5034    5085    5119    5154    5188
                    5238    5328    5399    5465    5516    5563    5621    5678    5687#   5709#   5713#   5727#   5746
                    5749#   5773    5783    5788#   5811    5941    5990    6038    6096    6181    6239    6318    6354
                    6434    6517    6580    6660    6696    6849    6944    6996    7061    7099    7151    7206
I$TST  = 000041     2211#   4801#   4814#   4826#   4839#   4854#   4877#   4888#   4904#   4915#   4937#   4953#   4973#
                    4990#   5014    5019#   5034#   5066    5073#   5085#   5107#   5119#   5142#   5154#   5176#   5188#
                    5211#   5238#   5312#   5328#   5341    5355    5367    5378    5383#   5399#   5427    5437    5444#
                    5465#   5499#   5516#   5549#   5563#   5596#   5621#   5661#   5678#   5687    5713    5728#   5746#
                    5749    5789#   5811#   5888    5911    5921#   5941#   5970#   5990#   6016#   6038#   6076#   6096#
                    6166#   6181#   6223#   6239#   6303#   6318#   6338#   6354#   6418#   6434#   6501#   6517#   6564#
                    6580#   6647#   6660#   6679#   6696#   6825#   6849#   6926#   6944#   6978#   6996#   7046#   7061#
                    7078#   7099#   7132#   7151#   7182#   7206#   7253#
I422   = 000200     2585#   2593
J$JMP  = 000167     2211#
LDMSG1   011374     4319#
LDTXSI   005174     3558#   3671    3672    3730    4223    5823    5824    5848    5896    6127    6325    6368    6448
                    6531    6594    6667    6866    6888    6918    6922    6951    7003    7067    7108    7109    7158
                    7215    7222    7223
LOADAT   002410     2718#   4501    5695*   5696*
LODMSG   011016     4216#   4321    7104    7218
LOE    = 040000 G   2354#
LOGDEV   002344     2699#   4667*   4673*   4674    4676    4722    4760
LOOPIN   004074     3345#   5252
LOT    = 000010 G   2354#
LULOOP= 000010      2373#   3254    3449    3587    3680    5623
LULP   = 000040     2404#   2469#   6364    6444    6527    6590    6712
LUREG    002302     2635    2636    2637    2638    2639    2640    2641    2642    2643    2644    2645    2646    2647
                    2648    2649    2650    2693#
LUR10  = 002302     2635#   3321    4452    4467    4486    4506    4525    4543    4563    4581
LUR11  = 002304     2636#   4452    4467    4486    4506    4525    4543    4563    4581
```

```
LUR12 = 002306          2637#  4452  4467  4486  4506  4525  4543  4563  4581
LUR13 = 002310          2638#  4452  4467  4486  4506  4525  4543  4563  4581
LUR14 = 002312          2639#  4454  4469  4488  4508  4527  4545  4565  4583
LUR15 = 002314          2640#  4454  4469  4488  4508  4527  4545  4565  4583
LUR16 = 002316          2641#  4454  4469  4488  4508  4527  4545  4565  4583
LUR17 = 002320          2642#  4454  4469  4488  4508  4527  4545  4565  4583
LUSWI1  002466          2744#
LUSWI2  002470          2745#
LUSWI3  002472          2746#
LU1MOD  002000 G        2217#
L$ACP   002110 G        2251#
L$APT   002036 G        2251#
L$AU    021634 G        2251   4779#
L$AUT   002070 G        2251#
L$AUTO  021470 G        2251   4713#
L$CCP   002106 G        2251#
L$CLEA  021550 G        2251   4739#
L$CO    002032 G        2251#
L$DEPO  002011 G        2251#
L$DESC  003470 G        2251   3197#
L$DESP  002076 G        2251#
L$DEVP  002060 G        2251#
L$DISP  002124 G        2251   2274#
L$DLY   002116 G        2251#
L$DTP   002040 G        2251#
L$DTYP  002034 G        2251#
L$DU    021552 G        2251   4756#
L$DUT   002072 G        2251#
L$DVTY  003462 G        2251   3191#
L$EF    002052 G        2251#
L$ENVI  002044 G        2251#
L$ETP   002102 G        2251#
L$EXP1  002046 G        2251#
L$EXP4  002064 G        2251#
L$EXP5  002066 G        2251#
L$HARD  035556 G        2251   7280#
L$HIME  002120 G        2251#
L$HPCP  002016 G        2251#
L$HPTP  002022 G        2251#
L$HW    002252 G        2251   2296#
L$ICP   002104 G        2251#
L$INIT  021120 G        2251   4633#
L$LADP  002026 G        2251#
L$LAST  036234 G        2251   7339#
L$LOAD  002100 G        2251#
L$LUN   002074 G        2251#
L$MREV  002050 G        2251#
L$NAME  002000 G        2251#
L$PRIO  002042 G        2251#
L$PROT  021112 G        2251   4615#
L$PRT   002112 G        2251#
L$REPP  002062 G        2251#
L$REV   002010 G        2251#
L$RPT   021110 G        4599#
L$SOFT  036022 G        7313#
L$SPC   002056 G        2251#
```

```
L$SPCP  002020 G        2251#
L$SPTP  002024 G        2251#
L$STA   002030 G        2251#
L$SW    002302 G        2324#
L$TEST  002114 G        2251#
L$TIML  002014 G        2251#
L$UNIT  002012 G        2251#   4674
L10000  002300          2296    2310#
L10001  002302          2324    2327#
L10002  014632          4442#
L10003  015140          4455#
L10004  015622          4474#
L10005  016300          4493#
L10006  017012          4513#
L10007  017470          4532#
L10010  020122          4550#
L10011  020630          4570#
L10012  021106          4584#
L10013  021110          4601#
L10015  021466          4699#
L10016  021546          4725#
L10017  021550          4742#
L10020  021600          4761#
L10021  021634          4780#
L10022  021716          4814#
L10023  022002          4839#
L10024  022126          4877#
L10025  022230          4904#
L10026  022356          4937#
L10027  022476          4973#
L10030  022652          5014    5019#
L10031  023106          5066    5073#
L10032  023224          5107#
L10033  023342          5142#
L10034  023460          5176#
L10035  023576          5211#
L10036  024226          5312#
L10037  024560          5341    5355    5367    5378    5383#
L10040  025050          5427    5437    5444#
L10041  025260          5499#
L10042  025464          5549#
L10043  025670          5596#
L10044  026126          5661#
L10045  026360          5728#
L10046  026264          5709#
L10047  026356          5727#
L10050  026632          5789#
L10051  026630          5773    5783    5788#
L10052  027310          5888    5911    5921#
L10053  027430          5970#
L10054  027540          6016#
L10055  027734          6076#
L10056  030300          6166#
L10057  030510          6223#
L10060  031040          6303#
L10061  031140          6338#
```

```
L10062  031510          6418#
L10063  032052          6501#
L10064  032322          6564#
L10065  032664          6647#
L10066  033014          6679#
L10067  033726          6825#
L10070  034210          6926#
L10071  034410          6978#
L10072  034710          7046#
L10073  035000          7078#
L10074  035142          7132#
L10075  035310          7182#
L10076  035536          7253#
L10077  035622          7280    7287#
L10100  036022          7313    7316#
MAINT1= 000010          2413#
MAINT2= 000004          2414#
MCLK  = 000002          2509#   5260    5265    5280    5299    5303
MCLR  = 000100          2371#   3248    3249
MODR  = 000010          2483#
MPCSR   002446          2735#   4441    4447    4462    4482    4500    4521    4539    4558    4577    4683*   4718    4806
MPIVEC  002460          2741#   4692*
MPOVEC  002462          2742#   4693*   4694*
MPRIOR  002464          2743#   4695*
MSG1    003220          3144#   4322    4324    4327    6322    6326    6335    6366    6369    6378    6392    6446    6449
                        6460    6461    6468    6490    6529    6532    6541    6555    6592    6595    6606    6607    6614
                        6636    6714    7105
MSG4    003246          3156#   7219
MSTCLR  003576          3245#   3656    4828    4855    4889    4893    4916    4954    4991    4999    5035    5086    5120
                        5155    5189    5239    5311    5329    5345    5400    5466    5517    5564    5622    5679    5716
                        5750    5816    5969    6015    6075    6158    6165    6337    6356    6417    6436    6500    6519
                        6563    6582    6646    6661    6678    6701    6824    6854    6925    6977    7045    7077    7130
                        7181    7252
MVIOX = 021000          2668#   3280    5250
MVIXO = 122000          2669#   3302
MVIXOX= 121000          2670#   4958
NEWST   021270          4657    4666#   4675
OACT  = 000100          2456#   3617    3623    3684
OACTIV  005352          3607#   3659    3676    3691    3741    3777    6723    6727    6748    6765    6786    6802    6821
                        7247
OC    = 000200          2393#   2455#   3772    6818    7174
OCOR  = 000020          2506#   3504    3510    3696    5836
OP    = 000002          2591#   2593
ORDY  = 000020          2458#   3488    3494    5056    5057    5868
OSIRDY  004662          3478#   3657    3674    3701    3745    3751    3775    5751    5761    5817    5826    5841    5855
                        5873    5898    5914    5917    6715    6721    6737    674C    6750
OVRR  = 000010          2471#   4144    4146    4152
O$APTS= 000000          2211#   2251
O$AU  = 000001          2211#   2241#   2251
O$BGNR= 000000          2211#   2251
O$BGNS= 000000          2211#   2251
O$DU  = 000001          2211#   2241#   2251
O$ERRT= 000000          2211#   2251
O$GNSW= 000000          2211#   2251
O$POIN= 000001          2211#   2241#   2251
O$SETU= 000000          2211#   2251    7339
```

```
PATA    002571          2805#  4857
PATB    002615          2828#  4875  5045
PATC    002625          2839#  5088
PATCH   036022          7328#
PATD    002630          2845#  5105  5122
PATE    002633          2851#  5140  5157
PATF    002641          2860#  5174  5191
PATG    002644          2866#  4993  5209
PATH    002654          2877#  4997  5331
PATI    002664          2888#  5343  5347  5401  5486  5489  5718  5721
PATJ    002674          2899#  5381  5404  5408  5409
PATK    002704          2910#  5467  5565
PATL    003014          2984#  5497  5518  5594
PATM    003022          2993#  4830  4833  4895  4898  4928  4931  4964  4967  5001  5037  5547
PATN    003032          3004#  5017  5747
PATO    003050          3021#  5680  5785
PATP    003066          3038#  5681  5707
PATU    003104          3055#  5625
PATV    003152          3095#  5624  5659
PNT   = 001000 G        2354#
POLL  = 000200          2409#
PRI   = 002000 G        2354#
PRIOR   002350          2701#
PRIRTY  035701          7284   7291#
PRI00 = 000000 G        2354#
PRI01 = 000040 G        2354#
PRI02 = 000100 G        2354#
PRI03 = 000140 G        2354#
PRI04 = 000200 G        2354#
PRI05 = 000240 G        2354#
PRI06 = 000300 G        2354#
PRI07 = 000340 G        2354#  4715  4717  4803  4805
PSTACK  002346          2700#  3516  3629  3841  3882  3936  4165  4301  4635*
RAB   = 000004          2472#  4129  4131  4137
RABT  = 000004          2532#
RAX15   002370          2710#  3382* 3383* 3453  5358* 5359  5363  5418* 5419  5423  5477  5480  5528
                        5531   5575  5578  5635* 5636* 5637  5641  5765  5769  5881  5884  5904  5907
                        6382   6385  6397  6400  6411  6480  6483  6545  6548  6626  6629  6670  6673
                        6774   6777  6794  6810
RAX16   002372          2711#  3386* 3387* 3455  3910  3916  3924  3930  5370  5374  5429  5433  5486
                        5490   5537  5540  5584  5587  5647  5651  5693  5699  5718  5722  5775  5779
RCVBUF  003262          3168#  4325
RCV1ST  007434          3976#  6870  6963  7009  7162  7233
RDALL = 000004          2436#
RDAX  = 000020          2422#  2494#  3369
RDRXSI  007354          3952#  4063  4245  7070
READAX  004124          3363#  3452  3907  5348  5415  5476  5527  5574  5632  5692  5717  5764  5880
                        5903   6381  6396  6410  6479  6544  6625  6669
READLU  003672          3272#  3323  3373  3381  3385  3424  3485  3501  3614  3683  3695  3780  3810
                        3826   3867  3954  3958  3997  4075  4282  4829  4863  4894  4926  4963  5004
                        5052   5093  5127  5162  5197  5835  5867  6067  6110  6119  6132  6151  6159
READY = 000200          2491#  3374  3425
REDBYT  002364          2708#  3284* 3285* 3324  3374  3382  3386  3425  3488  3494  3504  3510  3617
                        3623   3684  3696  3781  3813  3819  3829  3835  3870  3876  3955  3959  3998
                        4076   4285  4291  4830  4834  4864* 4865  4868  4895  4899  4927* 4928  4932
                        4964   4968  5005* 5006  5010  5053* 5056* 5058  5062  5094* 5095  5098  5128*
```

```
                    5130    5133    5163*   5164    5167    5198*   5199    5202    5259*   5260    5266    5279*   5280
                    5285    5298*   5299    5304    5836    5868    6068    6111    6120    6133    6152    6160
REDDAT  002500      2751#   5036    5046*   5047*   5057*   5058    5061    5402    5410*   5411*   5419    5422    5429
                    5432
REGNUM  002400      2714#   3247    3255*   3258*   3274    3300    3320    3322*   3326*   3327    3329*   3364    3366*
                    3380*   3384*   3388*   3402    3404*   3409*   3413*   3417*   3430*   3478    3484*   3500*   3515*
                    3521*   3558    3560*   3563*   3566*   3607    3613*   3628*   3634*   3652    3667*   3679*   3693*
                    3705*   3768    3771*   3779*   3787*   3803    3809*   3825*   3840*   3846*   3860    3866*   3881*
                    3887*   3952    3953*   3957*   3960*   3978    3981*   4013*   4029    4030*   4041*   4058    4074*
                    4082*   4088*   4164*   4169*   4184    4189*   4202*   4274    4279*   4306*   4449    4484    4501
                    4541    4560    4579    4827*   4856*   4890*   4917*   4955*   4956    4992*   4996*   5000*   5015*
                    5043*   5044*   5050*   5051*   5054    5087*   5121*   5156*   5190*   5247*   5337*   5351*   5682*
                    5753*   5756*   5832*   5863*   6043*   6066*   6109*   6362*   6442*   6525*   6588*   6662*   6707*
                    6711*   6814*   6817*   7173*
REG0    002510      2761#   5258*   5262*   5278*   5282*   5297*   5301*
REG1    002512      2762#
REG2    002514      2763#
REG3    002516      2764#
REG4    002520      2765#
REG5    002522      2766#
REG6    002524      2767#
REG7    002526      2768#
REQM  = 000002      2533#   3924    3930
RERR  = 000200      2527#
RETADR  002362      2707#   3517    3630    3842    3883    3937    4166    4302    5748*   5812*   5942*   5991*   6039*
                    6100*   6182*   6240*   6355*   6435*   6518*   6581*   6697*   6850*   6945*   6997*   7062*   7100*
                    7152*   7207*
RING  = 000200      2479#
ROMI  = 000002      2375#   3231    3233    3234    3346    3348
ROMO  = 000004      2374#   3231    3233    3234    3346    3348
ROR   = 000010      2531#
RRDYTO= 000001      2675#   3365    3378    5349
RSEOM   007102      3900#   3991    6456    6465    6472    6477    6494    6602    6611    6618    6623    6640    6744
                    6769    6790    6806
RSOM  = 000001      2534#   3910    3916
RTS   = 000040      2481#   3781    6068
RUN   = 000200      2370#   3249    3348    4921
RUNINH  002476      2748#   4697*   5241
RXABT = 002000      2625#
RXBCC = 000400      2627#   4329
RXCHAR  011074      4242#   6967    6971    6973    6975    7013    7017    7021    7025    7029    7033    7037    7041
                    7043
RXEBL = 001000      2626#
RXLEN0= 000001      2603#   4064    6957    6965    7015    7023    7031    7039
RXLEN1= 000002      2602#   4064    6961    6965    7015    7019    7031    7035
RXLEN2= 000004      2601#   4064    6957    6961    6965    7015    7019    7023    7027
RXOVR = 004000      2624#
RXWORD  002424      2724#   3955*   3956*   3959*   4067*   4068    4073    4089    4095    4100    4106    4115    4121
                    4131    4137    4146    4152
RX0   = 000001      2450#   2522#
RX1   = 000002      2449#   2521#
RX2   = 000004      2448#   2520#
RX3   = 000010      2447#   2519#
RX4   = 000020      2446#   2518#
RX5   = 000040      2445#   2517#
RX6   = 000100      2444#   2516#
```

```
RX7    = 000200          2443#  2515#
R14NRW   002560          2791#  4861   4864
SAVE4    002414          2720#  4643*  4646   4723   4812
SAVE6    002416          2721#  4644*  4647   4724   4813
SAVLEN   002432          2727#  3260*  4064   4199*  4640*
SCRACH   002342          2698#
SEC    = 000020          2576#
SECA   = 000020          2434#
SELFR  = 000040          2411#
SELSBY= 000002           2415#
SEL4     002454          2739#  4688*  4689*
SEL6     002456          2740#  3232*  3347*  4690*  4691*
SETUP    010640          4183#  6357   6437   6520   6583   6702
SFPTBL   002302 G        2324#
SIGQ   = 000100          2504#
SIGR   = 000200          2503#
SOM    = 000001          2397#
STALL    005164          3545#  3589   3591   3682   3687   3700
STARES   002444          2732#  4663*  4668*  5243
STARST   021260          4651   4654   4662#
STBY   = 000002          2485#
STEPLU= 000020           2372#  3588   3590   3681   3686   3699
STEPMP= 000001           2376#  3233   3234
STPCLK   003540          3230#  3282   3306   4961
STPERR   007646          4029#
STPLU    005254          3579#  3747   3993   4036   4161   4252   4280   5833   5865   5901   6064   6107   6117
                         6129   6149   6329   6372   6376   6390   6405   6413   6452   6458   6488   6535   6539
                         6553   6598   6604   6634   6725   6746   6761   6782   6798   6885   6897   6913   6959
                         7068   7111   7176   7227
STR    = 000040          2575#
STRIP  = 000010          2435#  5945   6042   6103   6145   6321   6359   6522   6863   7103   7212
SUBRPC   002352          2702#  3479   3480   3482*  3483*  3520*  3608   3609   3611*  3612*  3633*  3654*  3655*
                         3707*  3727*  3728*  3754*  3769*  3770*  3786*  3804   3805   3807*  3808*  3845*  3861
                         3862   3864*  3865*  3886*  3901   3902   3904*  3905*  3940*  3979*  3980*  4016*  4059*
                         4060*  4171*  4204*  4243*  4244*  4259*  4276*  4277*  4307*  4481   4520   4557   4636*
SVCGBL= 000000           2211#  2217   2225#  2251   2274   2296   2324   3191   3197   4440   4446   4461   4480
                         4499   4519   4538   4556   4576   4599   4615   4633   4713   4739   4756   4779   7280
                         7313   7339#
SVCINS= 000001           2211#  2222#  2251   2274   2296   2324   3191   3197   3492   3498   3508   3514   3621
                         3627   3785   3817   3823   3833   3839   3874   3880   3914   3920   3928   3934   4080
                         4085   4104   4110   4119   4125   4135   4141   4150   4156   4289   4295   4441   4442
                         4447   4448   4449   4450   4451   4452   4453   4454   4455   4462   4463   4464   4465
                         4466   4467   4468   4469   4470   4471   4472   4473   4474   4481   4482   4483   4484
                         4485   4486   4487   4488   4489   4490   4491   4492   4493   4500   4501   4502   4503
                         4504   4505   4506   4507   4508   4509   4510   4511   4512   4513   4520   4521   4522
                         4523   4524   4525   4526   4527   4528   4529   4530   4531   4532   4539   4540   4541
                         4542   4543   4544   4545   4546   4547   4548   4549   4550   4557   4558   4559   4560
                         4561   4562   4563   4564   4565   4566   4567   4568   4569   4570   4577   4578   4579
                         4580   4581   4582   4583   4584   4601   4650   4651   4653   4654   4656   4657   4659
                         4660   4676   4677   4699   4715   4722   4725   4742   4758   4760   4761   4780   4803
                         4811   4814   4837   4839   4859   4871   4873   4877   4902   4904   4920   4935   4937
                         4971   4973   5013   5014   5019   5065   5066   5073   5090   5101   5103   5107   5124
                         5136   5138   5142   5159   5170   5172   5176   5194   5205   5207   5211   5245   5269
                         5271   5288   5290   5307   5309   5312   5340   5341   5354   5355   5366   5367   5377
                         5378   5383   5426   5427   5436   5437   5444   5469   5483   5484   5493   5495   5499
                         5520   5534   5535   5543   5545   5549   5567   5581   5582   5590   5592   5596   5627
```

```
                    5644  5645  5654  5656  5661  5687  5689  5702  5704  5709  5713  5725  5727
                    5728  5749  5772  5773  5782  5783  5788  5789  5887  5888  5910  5911  5921
                    5970  6016  6072  6076  6115  6124  6137  6156  6164  6166  6223  6303  6338
                    6388  6403  6418  6486  6501  6551  6564  6632  6647  6676  6679  6780  6825
                    6926  6978  7046  7078  7132  7182  7253  7280  7282  7283  7284  7285  7287
                    7313  7316  7339
SVCSUB= 000001       2211#  2224#  5687  5713  5749
SVCTAG= 000001       2211#  2226#  2310  2327  4442  4455  4474  4493  4513  4532  4550  4570  4584
                    4601  4699  4725  4742  4761  4780  4814  4839  4873  4877  4904  4937  4973
                    5019  5073  5103  5107  5138  5142  5172  5176  5207  5211  5312  5383  5444
                    5495  5499  5545  5549  5592  5596  5656  5661  5704  5709  5727  5728  5788
                    5789  5921  5970  6016  6076  6166  6223  6303  6338  6418  6501  6564  6647
                    6679  6825  6926  6978  7046  7078  7132  7182  7253  7287  7316
SVCTST= 000001       2211#  2223#  4801  4826  4854  4888  4915  4953  4990  5034  5085  5119  5154
                    5188  5238  5328  5399  5465  5516  5563  5621  5678  5746  5811  5941  5990
                    6038  6096  6181  6239  6318  6354  6434  6517  6580  6660  6696  6849  6944
                    6996  7061  7099  7151  7206
SW0    = 000002      2461#
SW1    = 000004      2460#
SW2    = 000010      2459#
SW3    = 000040      2457#
SYNCH  = 000226      2568#  5944  6041  6102  6144  6320  6358  6521  6862  7064  7154  7157  7166
                    7171
SYNPAT   035540      7208  7250  7255#
SYN0   = 000001      2567#
SYN1   = 000002      2566#
SYN2   = 000004      2565#
SYN3   = 000010      2564#
SYN4   = 000020      2563#
SYN5   = 000040      2562#
SYN6   = 000100      2561#
SYN7   = 000200      2560#
S$LSYM= 010000       2211#  2310#  2327#  4442#  4455#  4474#  4493#  4513#  4532#  4550#  4570#  4584#  4601#
                    4699#  4725#  4742#  4761#  4780#  4814#  4839#  4859#  4877#  4904#  4937#  4973#  5019#
                    5073#  5090#  5107#  5124#  5142#  5159#  5176#  5194#  5211#  5312#  5383#  5444#  5469#
                    5499#  5520#  5549#  5567#  5596#  5627#  5661#  5689#  5709#  5727#  5728#  5788#  5789#
                    5921#  5970#  6016#  6076#  6166#  6223#  6303#  6338#  6418#  6501#  6564#  6647#  6679#
                    6825#  6926#  6978#  7046#  7078#  7132#  7182#  7253#  7287#  7316#
TEOM   = 000002      2554#  6736  6759
TERR   = 000200      2551#
TEST   = 000001      2592#  5633
TESTMD= 000004       2508#
TIMFLG   002360      2706#
TMP0     002530      2771#  3444*  3447*  4464  4503  4523
TMP1     002532      2772#  3462*  3463*  4464  4503  4523
TMP2     002534      2773#
TMP3     002536      2774#
TMP4     002540      2775#
TMP5     002542      2776#
TMP6     002544      2777#
TMP7     002546      2778#
TSOM   = 000001      2555#
TSTCON   002474      2747#
TSTNUM   002442      2731#  5240*  5245
TXAB   = 000004      2553#
TXABT  = 002000      2613#
```

```
TXCHAR  006122  3725# 5946  5949  5952  5955  5958  5961  5964  5995  5998  6001  6004  6007
                6010  6046  6049  6052  6055  6058  6061  6104  6146  6190  6194  6199  6204
                6209  6212  6215  6218  6244  6247  6250  6257  6262  6267  6272  6277  6282
                6287  6292  6295  6298
TXDATA= 000040  2505# 4285  4291
TXEN  = 000100  2420# 2492# 4927  6044  6708  6710
TXEOM = 001000  2614# 3151  3152  3153  3154  3160  3161  5953  5956  5959  5962  5965  6002
                6005  6008  6011  6053  6056  6059  6062  6210  6213  6216  6219  6293  6296
                6299  6921  7107  7221
TXGA  = 000010  2552#
TXGOA = 004000  2612# 7107
TXLEN0= 000040  2600# 4064  6188  6202  6255  6265  6275  6285
TXLEN1= 000100  2599# 4064  6197  6202  6260  6265  6280  6285
TXLEN2= 000200  2598# 4064  6188  6197  6202  6270  6275  6280  6285
TXSOM = 000400  2615# 3144  3145  3663  5822  6126  7213
TXWORD  002422  2723# 3559* 3561  3564  3663* 3664* 3729* 4222* 5822* 5847* 5895* 6126* 6324*
                6367* 6447* 6530* 6593* 6666* 6865* 6887* 6917* 6921* 6950* 7002* 7066* 7107*
                7157* 7213* 7221*
TX0   = 000001  2388# 2546#
TX1   = 000002  2387# 2545#
TX2   = 000004  2386# 2544#
TX3   = 000010  2385# 2543#
TX4   = 000020  2384# 2542#
TX5   = 000040  2383# 2541#
TX6   = 000100  2382# 2540#
TX7   = 000200  2381# 2539#
T$ARGC= 000001  2251# 4441# 4447# 4448# 4449# 4450# 4451# 4452# 4453# 4454# 4462# 4463# 4464#
                4465# 4466# 4467# 4468# 4469# 4470# 4471# 4472# 4473# 4481# 4482# 4483# 4484#
                4485# 4486# 4487# 4488# 4489# 4490# 4491# 4492# 4500# 4501# 4502# 4503# 4504#
                4505# 4506# 4507# 4508# 4509# 4510# 4511# 4512# 4520# 4521# 4522# 4523# 4524#
                4525# 4526# 4527# 4528# 4529# 4530# 4531# 4539# 4540# 4541# 4542# 4543# 4544#
                4545# 4546# 4547# 4548# 4549# 4557# 4558# 4559# 4560# 4561# 4562# 4563# 4564#
                4565# 4566# 4567# 4568# 4569# 4577# 4578# 4579# 4580# 4581# 4582# 4583# 4760#
                5245# 5271# 5290# 5309#
T$CODE= 012032  7282# 7283# 7284# 7285#
T$ERRN= 000032  2211# 3492# 3498# 3508# 3514# 3621# 3627# 3785# 3817# 3823# 3833# 3839# 3874#
                3880# 3914# 3920# 3928# 3934# 4080# 4085# 4104# 4110# 4119# 4125# 4135# 4141#
                4150# 4156# 4289# 4295# 4811# 4837# 4871# 4902# 4935# 4971# 5013# 5065# 5101#
                5136# 5170# 5205# 5269# 5288# 5307# 5340# 5354# 5366# 5377# 5426# 5436# 5483#
                5493# 5534# 5543# 5581# 5590# 5644# 5654# 5702# 5725# 5772# 5782# 5887# 5910#
                6072# 6115# 6124# 6137# 6156# 6164# 6388# 6403# 6486# 6551# 6632# 6676# 6780#
T$EXCP= 000000  7282# 7283# 7284# 7285#
T$FLAG= 000040  5014# 5066# 5341# 5355# 5367# 5378# 5427# 5437# 5484# 5535# 5582# 5645# 5773#
                5783# 5888# 5911#
T$GMAN= 000000  2211#
T$HILI= 000007  7282# 7283# 7284# 7285#
T$LAST= 000001  2211# 7339#
T$LOLI= 000000  7282# 7283# 7284# 7285#
T$LSYM= 010000  2211# 2310  2327  4442  4455  4474  4493  4513  4532  4550  4570  4584  4601
                4699  4725  4742  4761  4780  4814  4839  4877  4904  4937  4973  5019  5073
                5107  5142  5176  5211  5312  5383  5444  5499  5549  5596  5661  5709  5727
                5728  5788  5789  5921  5970  6016  6076  6166  6223  6303  6338  6418  6501
                6564  6647  6679  6825  6926  6978  7046  7078  7132  7182  7253  7287  7316
                7339#
T$LTNO= 000052
T$NEST= 177777  2211# 2217# 2296# 2310# 2324# 2327# 4440# 4442# 4446# 4455# 4461# 4474# 4480#
                4493# 4499# 4513# 4519# 4532# 4538# 4550# 4556# 4570# 4576# 4584# 4599# 4601#
```

```
                4615#  4619#  4633#  4699#  4713#  4725#  4739#  4742#  4756#  4761#  4779#  4780#  4801#
                4814#  4826#  4839#  4854#  4859#  4873#  4877#  4888#  4904#  4915#  4937#  4953#  4973#
                4990#  5019#  5034#  5073#  5085#  5090#  5103#  5107#  5119#  5124#  5138#  5142#  5154#
                5159#  5172#  5176#  5188#  5194#  5207#  5211#  5238#  5312#  5328#  5383#  5399#  5444#
                5465#  5469#  5495#  5499#  5516#  5520#  5545#  5549#  5563#  5567#  5592#  5596#  5621#
                5627#  5656#  5661#  5678#  5687#  5689#  5704#  5709#  5713#  5727#  5728#  5746#  5749#
                5788#  5789#  5811#  5921#  5941#  5970#  5990#  6016#  6038#  6076#  6096#  6166#  6181#
                6223#  6239#  6303#  6318#  6338#  6354#  6418#  6434#  6501#  6517#  6564#  6580#  6647#
                6660#  6679#  6696#  6825#  6849#  6926#  6944#  6978#  6996#  7046#  7061#  7078#  7099#
                7132#  7151#  7182#  7206#  7253#  7280#  7287#  7313#  7316#  7337#
T$NS0 = 000000   2217#  7337
T$NS1 = 000005   2296#  2310   2324#  2327   4440#  4442   4446#  4455   4461#  4474   4480#  4493   4499#
                 4513   4519#  4532   4538#  4550   4556#  4570   4576#  4584   4599#  4601   4615#  4619
                 4633#  4699   4713#  4725   4739#  4742   4756#  4761   4779#  4780   4801#  4814   4826#
                 4839   4854#  4877   4888#  4904   4915#  4937   4953#  4973   4990#  5019   5034#  5073
                 5085#  5107   5119#  5142   5154#  5176   5188#  5211   5238#  5312   5328#  5383   5399#
                 5444   5465#  5499   5516#  5549   5563#  5596   5621#  5661   5678#  5728   5746#  5789
                 5811#  5921   5941#  5970   5990#  6016   6038#  6076   6096#  6166   6181#  6223   6239#
                 6303   6318#  6338   6354#  6418   6434#  6501   6517#  6564   6580#  6647   6660#  6679
                 6696#  6825   6849#  6926   6944#  6978   6996#  7046   7061#  7078   7099#  7132   7151#
                 7182   7206#  7253   7280#  7287   7313#  7316
T$NS2 = 000002   4859#  4873   5090#  5103   5124#  5138   5159#  5172   5194#  5207   5469#  5495   5520#
                 5545   5567#  5592   5627#  5656   5687#  5709   5713#  5727   5749#  5788
T$NS3 = 000003   5689#  5704
T$PTNU= 000000   2211#
T$SAVL= 177777   2211#
T$SEGL= 177777   2211#  4859#  4873#  5090#  5103#  5124#  5138#  5159#  5172#  5194#  5207#  5469#  5484
                 5495#  5520#  5535   5545#  5567#  5582   5592#  5627#  5645   5656#  5689#  5704#
T$SEK0= 010000   4859#  4873   5090#  5103   5124#  5138   5159#  5172   5194#  5207   5469#  5484   5495
                 5520#  5535   5545   5567#  5582   5592   5627#  5645   5656   5689#  5704
T$SUBN= 000000   2211#  4801#  4826#  4854#  4888#  4915#  4953#  4990#  5034#  5085#  5119#  5154#  5188#
                 5238#  5328#  5399#  5465#  5516#  5563#  5621#  5678#  5687#  5713#  5746#  5749#  5811#
                 5941#  5990#  6038#  6096#  6181#  6239#  6318#  6354#  6434#  6517#  6580#  6660#  6696#
                 6849#  6944#  6996#  7061#  7099#  7151#  7206#
T$TAGL= 177777   2211#
T$TAGN= 010101   2211#  2296#  2324#  4440#  4446#  4461#  4480#  4499#  4519#  4538#  4556#  4576#  4599#
                 4615#  4633#  4713#  4739#  4756#  4779#  4801#  4826#  4854#  4888#  4915#  4953#  4990#
                 5034#  5085#  5119#  5154#  5188#  5238#  5328#  5399#  5465#  5516#  5563#  5621#  5678#
                 5687#  5713#  5746#  5749#  5811#  5941#  5990#  6038#  6096#  6181#  6239#  6318#  6354#
                 6434#  6517#  6580#  6660#  6696#  6849#  6944#  6996#  7061#  7099#  7151#  7206#  7280#
                 7313#
T$TEMP= 000000   2274#  2310#  2327#  4442#  4455#  4474#  4493#  4513#  4532#  4550#  4570#  4584#  4601#
                 4619#  4699#  4725#  4742#  4761#  4780#  4814#  4839#  4873#  4877#  4904#  4937#  4973#
                 5014#  5019#  5066#  5073#  5103#  5107#  5138#  5142#  5172#  5176#  5207#  5211#  5312#
                 5341#  5355#  5367#  5378#  5383#  5427#  5437#  5444#  5484#  5495#  5499#  5535#  5545#
                 5549#  5582#  5592#  5596#  5645#  5656#  5661#  5704#  5709#  5727#  5728#  5773#  5783#
                 5788#  5789#  5888#  5911#  5921#  5970#  6016#  6076#  6166#  6223#  6303#  6338#  6418#
                 6501#  6564#  6647#  6679#  6825#  6926#  6978#  7046#  7078#  7132#  7182#  7253#  7282#
                 7283#  7284#  7285#  7287#  7316#  7337#
T$TEST= 000052   2211#  4801#  4826#  4854#  4888#  4915#  4953#  4990#  5034#  5085#  5119#  5154#  5188#
                 5238#  5328#  5399#  5465#  5516#  5563#  5621#  5678#  5687   5713   5746#  5749   5811#
                 5941#  5990#  6038#  6096#  6181#  6239#  6318#  6354#  6434#  6517#  6580#  6660#  6696#
                 6849#  6944#  6996#  7061#  7099#  7151#  7206#  7339
T$TSTM= 177777   2211#  3492   3498   3508   3514   3621   3627   3785   3817   3823   3833   3839   3874
                 3880   3914   3920   3928   3934   4080   4085   4104   4110   4119   4125   4135   4141
                 4150   4156   4289   4295   4441   4442   4447   4448   4449   4450   4451   4452   4453
```

```
                    4454    4455    4462    4463    4464    4465    4466    4467    4468    4469    4470    4471    4472
                    4473    4474    4481    4482    4483    4484    4485    4486    4487    4488    4489    4490    4491
                    4492    4493    4500    4501    4502    4503    4504    4505    4506    4507    4508    4509    4510
                    4511    4512    4513    4520    4521    4522    4523    4524    4525    4526    4527    4528    4529
                    4530    4531    4532    4539    4540    4541    4542    4543    4544    4545    4546    4547    4548
                    4549    4550    4557    4558    4559    4560    4561    4562    4563    4564    4565    4566    4567
                    4568    4569    4570    4577    4578    4579    4580    4581    4582    4583    4584    4601    4650
                    4653    4656    4659    4676    4699    4715    4722    4725    4742    4758    4760    4761    4780
                    4803    4811    4814    4837    4839    4859    4871    4873    4877    4902    4904    4920    4935
                    4937    4971    4973    5013    5014    5019    5065    5066    5073    5090    5101    5103    5107
                    5124    5136    5138    5142    5159    5170    5172    5176    5194    5205    5207    5211    5245
                    5269    5271    5288    5290    5307    5309    5312    5340    5341    5354    5355    5366    5367
                    5377    5378    5383    5426    5427    5436    5437    5444    5469    5483    5484    5493    5495
                    5499    5520    5534    5535    5543    5545    5549    5567    5581    5582    5590    5592    5596
                    5627    5644    5645    5654    5656    5661    5687    5689    5702    5704    5709    5713    5725
                    5727    5728    5749    5772    5773    5782    5783    5788    5789    5887    5888    5910    5911
                    5921    5970    6016    6072    6076    6115    6124    6137    6156    6164    6166    6223    6303
                    6338    6388    6403    6418    6486    6501    6551    6564    6632    6647    6676    6679    6780
                    6825    6926    6978    7046    7078    7132    7182    7253
T$TSTS= 000001      2211#   4801#   4826#   4854#   4888#   4915#   4953#   4990#   5034#   5085#   5119#   5154#   5188#
                    5238#   5328#   5399#   5465#   5516#   5563#   5621#   5678#   5746#   5811#   5941#   5990#   6038#
                    6096#   6181#   6239#   6318#   6354#   6434#   6517#   6580#   6660#   6696#   6849#   6944#   6996#
                    7061#   7099#   7151#   7206#
T$$AU  = 010021     4779#   4780
T$$AUT= 010016      4713#   4725
T$$CLE= 010017      4739#   4742
T$$DU  = 010020     4756#   4761
T$$HAR= 010077      7280#   7287
T$$HW  = 010000     2296#   2310
T$$INI= 010015      4633#   4699
T$$MSG= 010012      4440#   4442    4446#   4455    4461#   4474    4480#   4493    4499#   4513    4519#   4532    4538#
                    4550    4556#   4570    4576#   4584
T$$PRO= 010014      4615#
T$$RPT= 010013      4599#   4601
T$$SEG= 010000      4859#   4873#   5090#   5103#   5124#   5138#   5159#   5172#   5194#   5207#   5469#   5484    5495#
                    5520#   5535    5545#   5567#   5582    5592#   5627#   5645    5656#   5689#   5704#
T$$SOF= 010100      7313#   7316
T$$SUB= 010051      5687#   5709    5713#   5727    5749#   5773    5783    5788
T$$SW  = 010001     2324#   2327
T$$TES= 010076      4801#   4814    4826#   4839    4854#   4877    4888#   4904    4915#   4937    4953#   4973    4990#
                    5014    5019    5034#   5066    5073    5085#   5107    5119#   5142    5154#   5176    5188#   5211
                    5238#   5312    5328#   5341    5355    5367    5378    5383    5399#   5427    5437    5444    5465#
                    5499    5516#   5549    5563#   5596    5621#   5661    5678#   5728    5746#   5789    5811#   5888
                    5911    5921    5941#   5970    5990#   6016    6038#   6076    6096#   6166    6181#   6223    6239#
                    6303    6318#   6338    6354#   6418    6434#   6501    6517#   6564    6580#   6647    6660#   6679
                    6696#   6825    6849#   6926    6944#   6978    6996#   7046    7061#   7078    7099#   7132    7151#
                    7182    7206#   7253
T1      021636 G    2274    4801#
T10     023226 G    2274    5119#
T11     023344 G    2274    5154#
T12     023462 G    2274    5188#
T13     023600 G    2274    5238#
T14     024230 G    2274    5328#
T15     024562 G    2274    5399#
T16     025052 G    2274    5465#
T17     025262 G    2274    5516#
```

```
T18     025466 G        2274    5563#
T19     025672 G        2274    5621#
T2      021720 G        2274    4826#
T20     026130 G        2274    5678#
T20.1   026160          5687#
T20.2   026266          5713#
T21     026362 G        2274    5746#
T21.1   026374          5749#
T22     026634 G        2274    5811#
T23     027312 G        2274    5941#
T24     027432 G        2274    5990#
T25     027542 G        2274    6038#
T26     027736 G        2274    6096#
T27     030302 G        2274    6181#
T28     030512 G        2274    6239#
T29     031042 G        2274    6318#
T3      022004 G        2274    4854#
T30     031142 G        2274    6354#
T31     031512 G        2274    6434#
T32     032054 G        2274    6517#
T33     032324 G        2274    6580#
T34     032666 G        2274    6660#
T35     033016 G        2274    6696#
T36     033730 G        2274    6849#
T37     034212 G        2274    6944#
T38     034412 G        2274    6996#
T39     034712 G        2274    7061#
T4      022130 G        2274    4888#
T40     035002 G        2274    7099#
T41     035144 G        2274    7151#
T42     035312 G        2274    7206#
T5      022232 G        2274    4915#
T6      022360 G        2274    4953#
T7      022500 G        2274    4990#
T8      022654 G        2274    5034#
T9      023110 G        2274    5085#
UAM   = 000200 G        2354#
UNIT    002440          2730#
UNRR  = 000001          2462#   4076    6111    6120    6133    6152    6160
UPBITS  002550          2781#   5002    5047    5053    5094    5128    5163    5198
VECTOR  035650          7283    7290#
V35   = 000020          2588#   2593
WAIT50  005146          3531#   3673    3731    3774    3995    4226    4246    5760    5825    5849    6128    6328    6371
                        6451    6534    6597    6820    6954    7006    7110    7161    7224
WAX   = 000010          2423#   2495#   3420
WAX15   002374          2712#   3410*   3411    3662*   3664    4186*   4196*   5332*   5408*   5410    5471*   5473*   5477
                        5479    5522*   5524*   5528    5530    5569*   5571*   5575    5577    5629*   5633    6187*   6254*
                        6718*   6730*   6758*   6956*   7008*
WAX16   002376          2713#   3414*   3415    3665*   4187*   4198*   4199    5333*   5409*   5411    5472*   5474*   5523*
                        5525*   5537    5539    5570*   5572*   5584    5586    5630*   6188*   6197*   6202*   6207*   6255*
                        6260*   6265*   6270*   6275*   6280*   6285*   6290*   6719*   6731*   6736*   6759*   6957*   6961*
                        6965*   6969*   7011*   7015*   7019*   7023*   7027*   7031*   7035*   7039*
WRDYTO= 000002          2676#   3403    3429    5335
WRIBYT  002366          2709#   3256*   3304*   3305    3367*   3368*   3369*   3370*   3405*   3406*   3407*   3411*   3415*
                        3418*   3419*   3420*   3421*   3561*   3564*   3669*   3772*   4031*   4032*   4038*   4191*   4860*
                        4861*   4865    4867    4891*   4918*   4994*   5045*   5046    5091*   5095    5097    5125*   5130
```

```
                    5132  5160* 5164  5166  5195* 5199  5201  5690* 5714* 5754* 5757* 6044* 6364*
                    6444* 6496* 6527* 6559* 6590* 6642* 6663* 6708* 6712* 6815* 6818* 7174*
WRITAX  004312      3401# 3666  4188  4200  5334  5412  5475  5526  5573  5631  6189  6198  6203
                    6208  6256  6261  6266  6271  6276  6281  6286  6291  6720  6739  6760  6958
                    6962  6966  6970  7012  7016  7020  7024  7028  7032  7036  7040
WRITLU  003750      3257  3298# 3371  3408  3412  3416  3422  3562  3565  3670  3773  4033  4039
                    4193  4862  4892  4919  4995  5048  5092  5126  5161  5196  5691  5715  5755
                    5758  5759  6045  6365  6445  6497  6528  6560  6591  6643  6664  6709  6713
                    6816  6819  7175
XYZ     = 000100    2586# 2593
X$ALWA= 000000      2211#
X$FALS= 000040      2211#
X$OFFS= 000400      2211#
X$TRUE= 000020      2211#
$LSTIN= 000001      2220#
$LSTTA= 000001      2221#
.       = 036234    2203# 2693# 3168# 3197# 4434# 4764# 5014  5066  5341  5355  5367  5378  5427
                    5437  5484  5535  5582  5645  5773  5783  5888  5911  7329#
```

```
BCOMPL    15#  2211#  4651  4654  4657  4660  4677
BERROR    19#  2211#
BGNAU     23#  2211#  4779
BGNAUT    31#  2211#  4713
BGNCLN    39#  2211#  4739
BGNDU     47#  2211#  4756
BGNHRD    55#  2211#  7280
BGNHW     66#  2211#  2296
BGNINI    77#  2211#  4633
BGNMOD    85#  2211#  2217
BGNMSG    98#  2211#  4440  4446  4461  4480  4499  4519  4538  4556  4576
BGNPRO   106#  2211#  4615
BGNPTA   114#  2211#
BGNRPT   144#  2211#  4599
BGNSEG   152#  2211#  4859  5090  5124  5159  5194  5469  5520  5567  5627  5689
BGNSET   161#  2211#
BGNSFT   182#  2211#  7313
BGNSRV   193#  2211#
BGNSUB   201#  2211#  5687  5713  5749
BGNSW    225#  2211#  2324
BGNTST   236#  2211#  4801  4826  4854  4888  4915  4953  4990  5034  5085  5119  5154  5188  5238
        5328   5399   5465  5516  5563  5621  5678  5746  5811  5941  5990  6038  6096  6181  6239
        6318   6354   6434  6517  6580  6660  6696  6849  6944  6996  7061  7099  7151  7206
BNCOMP   266#  2211#
BNERRO   270#  2211#
BREAK    274#  2211#
BRESET   278#  2211#  4758  4920
CKLOOP   282#  2211#
CLOCK    286#  2211#
CLOSE    292#  2211#
CLRVEC   296#  2211#
COMMEN   301#  2211#
DELAY    322#  2211#
DESCRI   317#  2211#  3197
DEVTYP   341#  2211#  3191
DISPAT   346#  2211#  2274
DISPLA   360#  2211#
DOCLN    376#  2211#
DODU     380#  2211#  4722
DORPT    385#  2211#
ENDAU    389#  2211#  4780
ENDAUT   401#  2211#  4725
ENDCLN   413#  2211#  4742
ENDCOM   425#  2211#
ENDDU    441#  2211#  4761
ENDHRD   453#  2211#  7287
ENDHW    465#  2211#  2310
ENDINI   475#  2211#  4699
ENDMOD   487#  2211#  7337
ENDMSG   500#  2211#  4442  4455  4474  4493  4513  4532  4550  4570  4584
ENDPRO   512#  2211#  4619
ENDPTA   520#  2211#
ENDRPT   529#  2211#  4601
ENDSEG   541#  2211#  4873  5103  5138  5172  5207  5495  5545  5592  5656  5704
ENDSET   555#  2211#
ENDSFT   568#  2211#  7316
```

```
ENDSRV    580#  2211#
ENDSUB    596#  2211#  5709  5727  5788
ENDSW     614#  2211#  2327
ENDTST    624#  2211#  4814  4839  4877  4904  4937  4973  5019  5073  5107  5142  5176  5211  5312
          5383  5444  5499  5549  5596  5661  5728  5789  5921  5970  6016  6076  6166  6223  6303
          6338  6418  6501  6564  6647  6679  6825  6926  6978  7046  7078  7132  7182  7253
EQUALS    642#  2211#  2354
ERRDF     714#  2211#  3492  3498  3508  3514  3621  3627  3785  3817  3823  3833  3839  3874  3880
          3914  3920  3928  3934  4080  4085  4104  4110  4119  4125  4135  4141  4150  4156  4289
          4295  4811  4837  4871  4902  4935  4971  5013  5065  5101  5136  5170  5205  5269  5288
          5307  5340  5354  5366  5377  5426  5436  5483  5493  5534  5543  5581  5590  5644  5654
          5702  5725  5772  5782  5887  5910  6072  6115  6124  6137  6156  6164  6388  6403  6486
          6551  6632  6676  6780
ERRHRD    718#  2211#
ERROR     722#  2211#
ERRSF     726#  2211#
ERRSOF    730#  2211#
ERRTBL    734#  2211#
ESCAPE    744#  2211#  5014  5066  5341  5355  5367  5378  5427  5437  5484  5535  5582  5645  5773
          5783  5888  5911
EXIT      771#  2211#
FEQUAL    810#  2211#
GETBYT    824#  2211#
GETPRI    834#  2211#
GETWOR    829#  2211#
GMANIA    839#  2211#
GMANID    848#  2211#
GMANIL    859#  2211#
GPHARD    868#  2211#  4676
GPRMA     874#  2211#  7282  7283
GPRMD     903#  2211#  7284  7285
GPRML     934#  2211#
HEADER    954#  2211#  2251
INLOOP    962#  2211#
IOSETU    966#  2211#
IOSTAR    974#  2211#
KT11      982#  2211#
LASTAD   1147#  2211#  7339
MANUAL   1162#  2211#
MEMORY   1166#  2211#
M$BYTE   2000#  2211#  2251#
M$CHEC   2118#  2211#
M$CNTO   2182#  2211#  7282#  7283#  7284#  7285#
M$COUN   2066#  2211#  4441#  4447#  4448#  4449#  4450#  4451#  4452#  4453#  4454#  4462#  4463#  4464#  4465#
         4466#  4467#  4468#  4469#  4470#  4471#  4472#  4473#  4481#  4482#  4483#  4484#  4485#  4486#  4487#
         4488#  4489#  4490#  4491#  4492#  4500#  4501#  4502#  4503#  4504#  4505#  4506#  4507#  4508#  4509#
         4510#  4511#  4512#  4520#  4521#  4522#  4523#  4524#  4525#  4526#  4527#  4528#  4529#  4530#  4531#
         4539#  4540#  4541#  4542#  4543#  4544#  4545#  4546#  4547#  4548#  4549#  4557#  4558#  4559#  4560#
         4561#  4562#  4563#  4564#  4565#  4566#  4567#  4568#  4569#  4577#  4578#  4579#  4580#  4581#  4582#
         4583#  4760#  5245#  5271#  5290#  5309#
M$DATA   1867#  2211#  2251#  3191#  3197#
M$DECR   2029#  2211#  2310#  2327#  4442#  4455#  4474#  4493#  4513#  4532#  4550#  4570#  4584#  4601#  4619#
         4699#  4725#  4742#  4761#  4780#  4814#  4839#  4873#  4877#  4904#  4937#  4973#  5019#  5073#  5103#
         5107#  5138#  5142#  5172#  5176#  5207#  5211#  5312#  5383#  5444#  5495#  5499#  5545#  5549#  5592#
         5596#  5656#  5661#  5704#  5709#  5727#  5728#  5788#  5789#  5921#  5970#  6016#  6076#  6166#  6223#
         6303#  6338#  6418#  6501#  6564#  6647#  6679#  6825#  6926#  6978#  7046#  7078#  7132#  7182#  7253#
```

```
            7287#  7316#  7337#
M$DEFA      2170#  2211#  7282#  7283#  7284#  7285#
M$ENDE      2074#  2211#  2310#  2327#  4442#  4455#  4474#  4493#  4513#  4532#  4550#  4570#  4584#  4601#  4699#
            4725#  4742#  4761#  4780#  4814#  4839#  4873#  4877#  4904#  4937#  4973#  5019#  5073#  5103#  5107#
            5138#  5142#  5172#  5176#  5207#  5211#  5312#  5383#  5444#  5495#  5499#  5545#  5549#  5592#  5596#
            5656#  5661#  5704#  5709#  5727#  5728#  5788#  5789#  5921#  5970#  6016#  6076#  6166#  6223#  6303#
            6338#  6418#  6501#  6564#  6647#  6679#  6825#  6926#  6978#  7046#  7078#  7132#  7182#  7253#  7287#
            7316#  7337#
M$ERRI      1649#  2211#  3492#  3498#  3508#  3514#  3621#  3627#  3785#  3817#  3823#  3833#  3839#  3874#  3880#
            3914#  3920#  3928#  3934#  4080#  4085#  4104#  4110#  4119#  4125#  4135#  4141#  4150#  4156#  4289#
            4295#  4811#  4837#  4871#  4902#  4935#  4971#  5013#  5065#  5101#  5136#  5170#  5205#  5269#  5288#
            5307#  5340#  5354#  5366#  5377#  5426#  5436#  5483#  5493#  5534#  5543#  5581#  5590#  5644#  5654#
            5702#  5725#  5772#  5782#  5887#  5910#  6072#  6115#  6124#  6137#  6156#  6164#  6388#  6403#  6486#
            6551#  6632#  6676#  6780#
M$ESCA      2006#  2211#  5014#  5066#  5341#  5355#  5367#  5378#  5427#  5437#  5484#  5535#  5582#  5645#  5773#
            5783#  5888#  5911#
M$ESCS      2010#  2211#  5014#  5066#  5341#  5355#  5367#  5378#  5427#  5437#  5484#  5535#  5582#  5645#  5773#
            5783#  5888#  5911#
M$EXCP      2101#  2211#  7282#  7283#  7284#  7285#
M$EXIT      2014#  2211#
M$EXSE      2022#  2211#
M$EXTJ      2018#  2211#
M$GEN       2038#  2211#  2217#  2251#  2274#  2296#  2310#  2324#  2327#  3191#  3197#  4440#  4442#  4446#  4455#
            4461#  4474#  4480#  4493#  4499#  4513#  4519#  4532#  4538#  4550#  4556#  4570#  4576#  4584#  4599#
            4601#  4615#  4633#  4699#  4713#  4725#  4739#  4742#  4756#  4761#  4779#  4780#  4801#  4814#  4826#
            4839#  4854#  4873#  4877#  4888#  4904#  4915#  4937#  4953#  4973#  4990#  5019#  5034#  5073#  5085#
            5103#  5107#  5119#  5138#  5142#  5154#  5172#  5176#  5188#  5207#  5211#  5238#  5312#  5328#  5383#
            5399#  5444#  5465#  5495#  5499#  5516#  5545#  5549#  5563#  5592#  5596#  5621#  5656#  5661#  5678#
            5687#  5704#  5709#  5713#  5727#  5728#  5746#  5749#  5788#  5789#  5811#  5921#  5941#  5970#  5990#
            6016#  6038#  6076#  6096#  6166#  6181#  6223#  6239#  6303#  6318#  6338#  6354#  6418#  6434#  6501#
            6517#  6564#  6580#  6647#  6660#  6679#  6696#  6825#  6849#  6926#  6944#  6978#  6996#  7046#  7061#
            7078#  7099#  7132#  7151#  7182#  7206#  7253#  7280#  7287#  7313#  7316#  7339#
M$GENB      1938#  2211#
M$GETS      2035#  2211#  2310#  2327#  4442#  4455#  4474#  4493#  4513#  4532#  4550#  4570#  4584#  4601#  4619#
            4699#  4725#  4742#  4761#  4780#  4814#  4839#  4873#  4877#  4904#  4937#  4973#  5019#  5073#  5103#
            5107#  5138#  5142#  5172#  5176#  5207#  5211#  5312#  5383#  5444#  5484#  5495#  5499#  5535#  5545#
            5549#  5582#  5592#  5596#  5645#  5656#  5661#  5704#  5709#  5727#  5728#  5788#  5789#  5921#  5970#
            6016#  6076#  6166#  6223#  6303#  6338#  6418#  6501#  6564#  6647#  6679#  6825#  6926#  6978#  7046#
            7078#  7132#  7182#  7253#  7287#  7316#  7337#
M$GETT      1877#  2211#  5014#  5066#  5341#  5355#  5367#  5378#  5427#  5437#  5484#  5535#  5582#  5645#  5773#
            5783#  5888#  5911#
M$GNGB      1902#  2211#  2217#  2251#  2274#  2296#  2324#  3191#  3197#  4440#  4446#  4461#  4480#  4499#  4519#
            4538#  4556#  4576#  4599#  4615#  4633#  4713#  4739#  4756#  4779#  7280#  7313#  7339#
M$GNIN      2049#  2211#  2251#  2274#  2296#  2324#  3191#  3197#  3492#  3498#  3508#  3514#  3621#  3627#  3785#
            3817#  3823#  3833#  3839#  3874#  3880#  3914#  3920#  3928#  3934#  4080#  4085#  4104#  4110#  4119#
            4125#  4135#  4141#  4150#  4156#  4289#  4295#  4441#  4442#  4447#  4448#  4449#  4450#  4451#  4452#
            4453#  4454#  4455#  4462#  4463#  4464#  4465#  4466#  4467#  4468#  4469#  4470#  4471#  4472#  4473#
            4474#  4481#  4482#  4483#  4484#  4485#  4486#  4487#  4488#  4489#  4490#  4491#  4492#  4493#  4500#
            4501#  4502#  4503#  4504#  4505#  4506#  4507#  4508#  4509#  4510#  4511#  4512#  4513#  4520#  4521#
            4522#  4523#  4524#  4525#  4526#  4527#  4528#  4529#  4530#  4531#  4532#  4539#  4540#  4541#  4542#
            4543#  4544#  4545#  4546#  4547#  4548#  4549#  4550#  4557#  4558#  4559#  4560#  4561#  4562#  4563#
            4564#  4565#  4566#  4567#  4568#  4569#  4570#  4577#  4578#  4579#  4580#  4581#  4582#  4583#  4584#
            4601#  4650#  4651#  4653#  4654#  4656#  4657#  4659#  4660#  4676#  4677#  4699#  4715#  4722#  4725#
            4742#  4758#  4760#  4761#  4780#  4803#  4811#  4814#  4837#  4839#  4859#  4871#  4873#  4877#  4902#
            4904#  4920#  4935#  4937#  4971#  4973#  5013#  5014#  5019#  5065#  5066#  5073#  5090#  5101#  5103#
            5107#  5124#  5136#  5138#  5142#  5159#  5170#  5172#  5176#  5194#  5205#  5207#  5211#  5245#  5269#
```

```
                5271#  5288#  5290#  5307#  5309#  5312#  5340#  5341#  5354#  5355#  5366#  5367#  5377#  5378#  5383#
                5426#  5427#  5436#  5437#  5444#  5469#  5483#  5484#  5493#  5495#  5499#  5520#  5534#  5535#  5543#
                5545#  5549#  5567#  5581#  5582#  5590#  5592#  5596#  5627#  5644#  5645#  5654#  5656#  5661#  5687#
                5689#  5702#  5704#  5709#  5713#  5725#  5727#  5728#  5749#  5772#  5773#  5782#  5783#  5788#  5789#
                5887#  5888#  5910#  5911#  5921#  5970#  6016#  6072#  6076#  6115#  6124#  6137#  6156#  6164#  6166#
                6223#  6303#  6338#  6388#  6403#  6418#  6486#  6501#  6551#  6564#  6632#  6647#  6676#  6679#  6780#
                6825#  6926#  6978#  7046#  7078#  7132#  7182#  7253#  7280#  7282#  7283#  7284#  7285#  7287#  7313#
                7316#  7339#
M$GNLS          1913#  2211#  4873#  5103#  5138#  5172#  5207#  5495#  5545#  5592#  5656#  5704#
M$GNSU          1898#  2211#  5687#  5713#  5749#
M$GNTA          1890#  2211#  2310#  2327#  4442#  4455#  4474#  4493#  4513#  4532#  4550#  4570#  4584#  4601#  4699#
                4725#  4742#  4761#  4780#  4814#  4839#  4877#  4904#  4937#  4973#  5019#  5073#  5107#  5142#  5176#
                5211#  5312#  5383#  5444#  5499#  5549#  5596#  5661#  5709#  5727#  5728#  5788#  5789#  5921#  5970#
                6016#  6076#  6166#  6223#  6303#  6338#  6418#  6501#  6564#  6647#  6679#  6825#  6926#  6978#  7046#
                7078#  7132#  7182#  7253#  7287#  7316#
M$GNTE          1894#  2211#  4801#  4826#  4854#  4888#  4915#  4953#  4990#  5034#  5085#  5119#  5154#  5188#  5238#
                5328#  5399#  5465#  5516#  5563#  5621#  5678#  5746#  5811#  5941#  5990#  6038#  6096#  6181#  6239#
                6318#  6354#  6434#  6517#  6580#  6660#  6696#  6849#  6944#  6996#  7061#  7099#  7151#  7206#
M$HAPT          1739#  2211#  2251#
M$HNAP          1824#  2211#  2251#
M$INCR          2026#  2211#  2217#  2296#  2324#  3492#  3498#  3508#  3514#  3621#  3627#  3785#  3817#  3823#  3833#
                3839#  3874#  3880#  3914#  3920#  3928#  3934#  4080#  4085#  4104#  4110#  4119#  4125#  4135#  4141#
                4150#  4156#  4289#  4295#  4440#  4441#  4442#  4446#  4447#  4448#  4449#  4450#  4451#  4452#  4453#
                4454#  4455#  4461#  4462#  4463#  4464#  4465#  4466#  4467#  4468#  4469#  4470#  4471#  4472#  4473#
                4474#  4480#  4481#  4482#  4483#  4484#  4485#  4486#  4487#  4488#  4489#  4490#  4491#  4492#  4493#
                4499#  4500#  4501#  4502#  4503#  4504#  4505#  4506#  4507#  4508#  4509#  4510#  4511#  4512#  4513#
                4519#  4520#  4521#  4522#  4523#  4524#  4525#  4526#  4527#  4528#  4529#  4530#  4531#  4532#  4538#
                4539#  4540#  4541#  4542#  4543#  4544#  4545#  4546#  4547#  4548#  4549#  4550#  4556#  4557#  4558#
                4559#  4560#  4561#  4562#  4563#  4564#  4565#  4566#  4567#  4568#  4569#  4570#  4576#  4577#  4578#
                4579#  4580#  4581#  4582#  4583#  4584#  4599#  4601#  4615#  4633#  4650#  4653#  4656#  4659#  4676#
                4699#  4713#  4715#  4722#  4725#  4739#  4742#  4756#  4758#  4760#  4761#  4779#  4780#  4801#  4803#
                4811#  4814#  4826#  4837#  4839#  4854#  4859#  4871#  4873#  4877#  4888#  4902#  4904#  4915#  4920#
                4935#  4937#  4953#  4971#  4973#  4990#  5013#  5014#  5019#  5034#  5065#  5066#  5073#  5085#  5090#
                5101#  5103#  5107#  5119#  5124#  5136#  5138#  5142#  5154#  5159#  5170#  5172#  5176#  5188#  5194#
                5205#  5207#  5211#  5238#  5245#  5269#  5271#  5288#  5290#  5307#  5309#  5312#  5328#  5340#  5341#
                5354#  5355#  5366#  5367#  5377#  5378#  5383#  5399#  5426#  5427#  5436#  5437#  5444#  5465#  5469#
                5483#  5484#  5493#  5495#  5499#  5516#  5520#  5534#  5535#  5543#  5545#  5549#  5563#  5567#  5581#
                5582#  5590#  5592#  5596#  5621#  5627#  5644#  5645#  5654#  5656#  5661#  5678#  5687#  5689#  5702#
                5704#  5709#  5713#  5725#  5727#  5728#  5746#  5749#  5772#  5773#  5782#  5783#  5788#  5789#  5811#
                5887#  5888#  5910#  5911#  5921#  5941#  5970#  5990#  6016#  6038#  6072#  6076#  6096#  6115#  6124#
                6137#  6156#  6164#  6166#  6181#  6223#  6239#  6303#  6318#  6338#  6354#  6388#  6403#  6418#  6434#
                6486#  6501#  6517#  6551#  6564#  6580#  6632#  6647#  6660#  6676#  6679#  6696#  6780#  6825#  6849#
                6926#  6944#  6978#  6996#  7046#  7061#  7078#  7099#  7132#  7151#  7182#  7206#  7253#  7280#  7313#
M$IOSE          1700#  2211#
M$LDRO          1942#  2211#  4650#  4653#  4656#  4659#  4676#  4715#  4722#  4803#
M$MASK          1671#  2211#
M$MCHI             4#  2211#
M$MCLO          1624#  2211#
M$MSK1          1677#  2211#
M$POP           1881#  2211#  2310#  2327#  4442#  4455#  4474#  4493#  4513#  4532#  4550#  4570#  4584#  4601#  4619#
                4699#  4725#  4742#  4761#  4780#  4814#  4839#  4873#  4877#  4904#  4937#  4973#  5019#  5073#  5103#
                5107#  5138#  5142#  5172#  5176#  5207#  5211#  5312#  5383#  5444#  5495#  5499#  5545#  5549#  5592#
                5596#  5656#  5661#  5704#  5709#  5727#  5728#  5788#  5789#  5921#  5970#  6016#  6076#  6166#  6223#
                6303#  6338#  6418#  6501#  6564#  6647#  6679#  6825#  6926#  6978#  7046#  7078#  7132#  7182#  7253#
                7287#  7316#  7337#
M$PRIN          1636#  2211#  4441#  4447#  4448#  4449#  4450#  4451#  4452#  4453#  4454#  4462#  4463#  4464#  4465#
```

```
                4466#  4467#  4468#  4469#  4470#  4471#  4472#  4473#  4481#  4482#  4483#  4484#  4485#  4486#  4487#
                4488#  4489#  4490#  4491#  4492#  4500#  4501#  4502#  4503#  4504#  4505#  4506#  4507#  4508#  4509#
                4510#  4511#  4512#  4520#  4521#  4522#  4523#  4524#  4525#  4526#  4527#  4528#  4529#  4530#  4531#
                4539#  4540#  4541#  4542#  4543#  4544#  4545#  4546#  4547#  4548#  4549#  4557#  4558#  4559#  4560#
                4561#  4562#  4563#  4564#  4565#  4566#  4567#  4568#  4569#  4577#  4578#  4579#  4580#  4581#  4582#
                4583#  4760#  5245#  5271#  5290#  5309#
M$PUSH          1631#  2211#  2217#  2296#  2324#  4440#  4446#  4461#  4480#  4499#  4519#  4538#  4556#  4576#  4599#
                4615#  4633#  4713#  4739#  4756#  4779#  4801#  4826#  4854#  4859#  4888#  4915#  4953#  4990#  5034#
                5085#  5090#  5119#  5124#  5154#  5159#  5188#  5194#  5238#  5328#  5399#  5465#  5469#  5516#  5520#
                5563#  5567#  5621#  5627#  5678#  5687#  5689#  5713#  5746#  5749#  5811#  5941#  5990#  6038#  6096#
                6181#  6239#  6318#  6354#  6434#  6517#  6580#  6660#  6696#  6849#  6944#  6996#  7061#  7099#  7151#
                7206#  7280#  7313#
M$PUT           1972#  2211#  4441#  4447#  4448#  4449#  4450#  4451#  4452#  4453#  4454#  4462#  4463#  4464#  4465#
                4466#  4467#  4468#  4469#  4470#  4471#  4472#  4473#  4481#  4482#  4483#  4484#  4485#  4486#  4487#
                4488#  4489#  4490#  4491#  4492#  4500#  4501#  4502#  4503#  4504#  4505#  4506#  4507#  4508#  4509#
                4510#  4511#  4512#  4520#  4521#  4522#  4523#  4524#  4525#  4526#  4527#  4528#  4529#  4530#  4531#
                4539#  4540#  4541#  4542#  4543#  4544#  4545#  4546#  4547#  4548#  4549#  4557#  4558#  4559#  4560#
                4561#  4562#  4563#  4564#  4565#  4566#  4567#  4568#  4569#  4577#  4578#  4579#  4580#  4581#  4582#
                4583#  4760#  5245#  5271#  5290#  5309#
M$PUT1          1981#  2211#  4441#  4447#  4448#  4449#  4450#  4451#  4452#  4453#  4454#  4462#  4463#  4464#  4465#
                4466#  4467#  4468#  4469#  4470#  4471#  4472#  4473#  4481#  4482#  4483#  4484#  4485#  4486#  4487#
                4488#  4489#  4490#  4491#  4492#  4500#  4501#  4502#  4503#  4504#  4505#  4506#  4507#  4508#  4509#
                4510#  4511#  4512#  4520#  4521#  4522#  4523#  4524#  4525#  4526#  4527#  4528#  4529#  4530#  4531#
                4539#  4540#  4541#  4542#  4543#  4544#  4545#  4546#  4547#  4548#  4549#  4557#  4558#  4559#  4560#
                4561#  4562#  4563#  4564#  4565#  4566#  4567#  4568#  4569#  4577#  4578#  4579#  4580#  4581#  4582#
                4583#  4760#  5245#  5271#  5290#  5309#
M$RADI          2077#  2211#  7282#  7283#  7284#  7285#
M$RBR0          1952#  2211#
M$RNR0          1962#  2211#  4676#
M$SETS          2032#  2211#  2217#  2296#  2324#  4440#  4446#  4461#  4480#  4499#  4519#  4538#  4556#  4576#  4599#
                4615#  4633#  4713#  4739#  4756#  4779#  4801#  4826#  4854#  4859#  4888#  4915#  4953#  4990#  5034#
                5085#  5090#  5119#  5124#  5154#  5159#  5188#  5194#  5238#  5328#  5399#  5465#  5469#  5516#  5520#
                5563#  5567#  5621#  5627#  5678#  5687#  5689#  5713#  5746#  5749#  5811#  5941#  5990#  6038#  6096#
                6181#  6239#  6318#  6354#  6434#  6517#  6580#  6660#  6696#  6849#  6944#  6996#  7061#  7099#  7151#
                7206#  7280#  7313#
M$STAR          1733#  2211#
M$SVC           1933#  2211#  3492   3498   3508   3514   3621   3627   3785   3817   3823   3833   3839   3874   3880
                3914   3920   3928   3934   4080   4085   4104   4110   4119   4125   4135   4141   4150   4156   4289
                4295   4441#  4442#  4447#  4448#  4449#  4450#  4451#  4452#  4453#  4454#  4455#  4462#  4463#  4464#
                4465#  4466#  4467#  4468#  4469#  4470#  4471#  4472#  4473#  4474#  4481#  4482#  4483#  4484#  4485#
                4486#  4487#  4488#  4489#  4490#  4491#  4492#  4493#  4500#  4501#  4502#  4503#  4504#  4505#  4506#
                4507#  4508#  4509#  4510#  4511#  4512#  4513#  4520#  4521#  4522#  4523#  4524#  4525#  4526#  4527#
                4528#  4529#  4530#  4531#  4532#  4539#  4540#  4541#  4542#  4543#  4544#  4545#  4546#  4547#  4548#
                4549#  4550#  4557#  4558#  4559#  4560#  4561#  4562#  4563#  4564#  4565#  4566#  4567#  4568#  4569#
                4570#  4577#  4578#  4579#  4580#  4581#  4582#  4583#  4584#  4601#  4650#  4653#  4656#  4659#  4676#
                4699#  4715#  4722#  4725#  4742#  4758#  4760#  4761#  4780#  4803#  4811   4814#  4837   4839#  4859#
                4871   4873#  4877#  4902   4904#  4920#  4935   4937#  4971   4973#  5013   5014#  5019#  5065   5066#
                5073#  5090#  5101   5103#  5107#  5124#  5136   5138#  5142#  5159#  5170   5172#  5176#  5194#  5205
                5207#  5211#  5245#  5269   5271#  5288   5290#  5307   5309#  5312#  5340   5341#  5354   5355#  5366
                5367#  5377   5378#  5383#  5426   5427#  5436   5437#  5444#  5469#  5483   5484#  5493   5495#  5499#
                5520#  5534   5535#  5543   5545#  5549#  5567#  5581   5582#  5590   5592#  5596#  5627#  5644   5645#
                5654   5656#  5661#  5687#  5689#  5702   5704#  5709#  5713#  5725   5727#  5728#  5749#  5772   5773#
                5782   5783#  5788#  5789#  5887   5888#  5910   5911#  5921#  5970#  6016#  6072   6076#  6115   6124
                6137   6156   6164   6166#  6223#  6303#  6338#  6388   6403   6418#  6486   6501#  6551   6564#  6632
                6647#  6676   6679#  6780   6825#  6926#  6978#  7046#  7078#  7132#  7182#  7253#
M$TLAB          1929#  2211#  3492#  3498#  3508#  3514#  3621#  3627#  3785#  3817#  3823#  3833#  3839#  3874#  3880#
```

```
                3914#  3920#  3928#  3934#  4080#  4085#  4104#  4110#  4119#  4125#  4135#  4141#  4150#  4156#  4289#
                4295#  4441#  4442#  4447#  4448#  4449#  4450#  4451#  4452#  4453#  4454#  4455#  4462#  4463#  4464#
                4465#  4466#  4467#  4468#  4469#  4470#  4471#  4472#  4473#  4474#  4481#  4482#  4483#  4484#  4485#
                4486#  4487#  4488#  4489#  4490#  4491#  4492#  4493#  4500#  4501#  4502#  4503#  4504#  4505#  4506#
                4507#  4508#  4509#  4510#  4511#  4512#  4513#  4520#  4521#  4522#  4523#  4524#  4525#  4526#  4527#
                4528#  4529#  4530#  4531#  4532#  4539#  4540#  4541#  4542#  4543#  4544#  4545#  4546#  4547#  4548#
                4549#  4550#  4557#  4558#  4559#  4560#  4561#  4562#  4563#  4564#  4565#  4566#  4567#  4568#  4569#
                4570#  4577#  4578#  4579#  4580#  4581#  4582#  4583#  4584#  4601#  4650#  4653#  4656#  4659#  4676#
                4699#  4715#  4722#  4725#  4742#  4758#  4760#  4761#  4780#  4803#  4811#  4814#  4837#  4839#  4859#
                4871#  4873#  4877#  4902#  4904#  4920#  4935#  4937#  4971#  4973#  5013#  5014#  5019#  5065#  5066#
                5073#  5090#  5101#  5103#  5107#  5124#  5136#  5138#  5142#  5159#  5170#  5172#  5176#  5194#  5205#
                5207#  5211#  5245#  5269#  5271#  5288#  5290#  5307#  5309#  5312#  5340#  5341#  5354#  5355#  5366#
                5367#  5377#  5378#  5383#  5426#  5427#  5436#  5437#  5444#  5469#  5483#  5484#  5493#  5495#  5499#
                5520#  5534#  5535#  5543#  5545#  5549#  5567#  5581#  5582#  5590#  5592#  5596#  5627#  5644#  5645#
                5654#  5656#  5661#  5687#  5689#  5702#  5704#  5709#  5713#  5725#  5727#  5728#  5749#  5772#  5773#
                5782#  5783#  5788#  5789#  5887#  5888#  5910#  5911#  5921#  5970#  6016#  6072#  6076#  6115#  6124#
                6137#  6156#  6164#  6166#  6223#  6303#  6338#  6388#  6403#  6418#  6486#  6501#  6551#  6564#  6632#
                6647#  6676#  6679#  6780#  6825#  6926#  6978#  7046#  7078#  7132#  7182#  7253#
M$TSTL          1921#  2211#  3492#  3498#  3508#  3514#  3621#  3627#  3785#  3817#  3823#  3833#  3839#  3874#  3880#
                3914#  3920#  3928#  3934#  4080#  4085#  4104#  4110#  4119#  4125#  4135#  4141#  4150#  4156#  4289#
                4295#  4441#  4442#  4447#  4448#  4449#  4450#  4451#  4452#  4453#  4454#  4455#  4462#  4463#  4464#
                4465#  4466#  4467#  4468#  4469#  4470#  4471#  4472#  4473#  4474#  4481#  4482#  4483#  4484#  4485#
                4486#  4487#  4488#  4489#  4490#  4491#  4492#  4493#  4500#  4501#  4502#  4503#  4504#  4505#  4506#
                4507#  4508#  4509#  4510#  4511#  4512#  4513#  4520#  4521#  4522#  4523#  4524#  4525#  4526#  4527#
                4528#  4529#  4530#  4531#  4532#  4539#  4540#  4541#  4542#  4543#  4544#  4545#  4546#  4547#  4548#
                4549#  4550#  4557#  4558#  4559#  4560#  4561#  4562#  4563#  4564#  4565#  4566#  4567#  4568#  4569#
                4570#  4577#  4578#  4579#  4580#  4581#  4582#  4583#  4584#  4601#  4650#  4653#  4656#  4659#  4676#
                4699#  4715#  4722#  4725#  4742#  4758#  4760#  4761#  4780#  4803#  4811#  4814#  4837#  4839#  4859#
                4871#  4873#  4877#  4902#  4904#  4920#  4935#  4937#  4971#  4973#  5013#  5014#  5019#  5065#  5066#
                5073#  5090#  5101#  5103#  5107#  5124#  5136#  5138#  5142#  5159#  5170#  5172#  5176#  5194#  5205#
                5207#  5211#  5245#  5269#  5271#  5288#  5290#  5307#  5309#  5312#  5340#  5341#  5354#  5355#  5366#
                5367#  5377#  5378#  5383#  5426#  5427#  5436#  5437#  5444#  5469#  5483#  5484#  5493#  5495#  5499#
                5520#  5534#  5535#  5543#  5545#  5549#  5567#  5581#  5582#  5590#  5592#  5596#  5627#  5644#  5645#
                5654#  5656#  5661#  5687#  5689#  5702#  5704#  5709#  5713#  5725#  5727#  5728#  5749#  5772#  5773#
                5782#  5783#  5788#  5789#  5887#  5888#  5910#  5911#  5921#  5970#  6016#  6072#  6076#  6115#  6124#
                6137#  6156#  6164#  6166#  6223#  6303#  6338#  6388#  6403#  6418#  6486#  6501#  6551#  6564#  6632#
                6647#  6676#  6679#  6780#  6825#  6926#  6978#  7046#  7078#  7132#  7182#  7253#
M$WORD          1994#  2211#  2251#  2274#  3492#  3498#  3508#  3514#  3621#  3627#  3785#  3817#  3823#  3833#  3839#
                3874#  3880#  3914#  3920#  3928#  3934#  4080#  4085#  4104#  4110#  4119#  4125#  4135#  4141#  4150#
                4156#  4289#  4295#  4811#  4837#  4871#  4902#  4935#  4971#  5013#  5065#  5101#  5136#  5170#  5205#
                5269#  5288#  5307#  5340#  5354#  5366#  5377#  5426#  5436#  5483#  5493#  5534#  5543#  5581#  5590#
                5644#  5654#  5702#  5725#  5772#  5782#  5887#  5910#  6072#  6115#  6124#  6137#  6156#  6164#  6388#
                6403#  6486#  6551#  6632#  6676#  6780#  7282#  7283#  7284#  7285#  7339
M$XFER          1682#  2211#
OPEN            1171#  2211#
POINTE          1176#  2211#  2241
PRINTB          1239#  2211#  4441   4447   4448   4449   4450   4462   4463   4464   4465   4481   4482   4483   4484
                4500   4501   4502   4503   4504   4520   4521   4522   4523   4539   4540   4541   4557   4558   4559
                4560   4561   4577   4578   4579
PRINTF          1279#  2211#  4760   5245   5271   5290   5309
PRINTS          1319#  2211#
PRINTX          1359#  2211#  4451   4452   4453   4454   4466   4467   4468   4469   4470   4471   4472   4473   4485
                4486   4487   4488   4489   4490   4491   4492   4505   4506   4507   4508   4509   4510   4511   4512
                4524   4525   4526   4527   4528   4529   4530   4531   4542   4543   4544   4545   4546   4547   4548
                4549   4562   4563   4564   4565   4566   4567   4568   4569   4580   4581   4582   4583
READBU          1399#  2211#
```

```
READEF   1403#   2211#   4650    4653    4656    4659
RFLAGS   1408#   2211#
SETPRI   1413#   2211#   4715    4803
SETVEC   1418#   2211#
SLASH    1424#   2211#
STARS    1438#   2211#
SVC      1452#   2210#   2211
XFER     1612#   2211#
XFERF    1616#   2211#
XFERT    1620#   2211#


. ABS.  036234     000


 ERRORS DETECTED:  0

 CZDMRC.BIN,CZDMRC.LST/CRF/NL:TOC=SVC34R.MLB,CZDMRC.P11
 RUN-TIME: 123 150 14 SECONDS
 RUN-TIME RATIO: 541/289=1.8
 CORE USED:  17K  (33 PAGES)
```