DPV-11 DPV 11 FUNC DIAG AH-S035A-MC SEP 1980
CVDPVA0 FICHE 1 OF 2

DPV-11 DPV-11 FUNC DIAG AH-S035A-MC
CVDPVAO FICHE 2 OF 2

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.NLIST  TOC
.REM @
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IDENTIFICATION

PRODUCT CODE: AC-S033A-MC

PRODUCT NAME: CVDPVA0 DPV11 FUNC DIAG

PRODUCT DATE: JUNE 1980

MAINTAINER: DIAGNOSTIC ENGINEERING

AUTHOR: MIKE O'CONNOR

CONTENTS

1.0 INTRODUCTION

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 LSI-BUS ADDRESS, VECTOR ADDRESSES AND DEVICE PRIORITY. IN ADDITION, THE OPERATOR CAN SPECIFY PARTICULAR TESTS TO BE RUN AND A VARIETY OF LOOPING, RUNNING, AND REPORTING MODES.

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

2.0 HARDWARE REQUIREMENTS

THE FOLLOWING HARDWARE IS REQUIRED TO RUN THE DPV11 FUNCTIONAL DIAGNOSTIC TESTS:

A LSI11 OR PDP11/03
16K MEMORY
CONSOLE TERMINAL
DPV11

3.0 PRELIMINARY PROGRAM REQUIREMENTS

IT IS ASSUMED THAT THE PROCESSOR IS IN PROPER WORKING CONDITION.

THE DEVICE ADDRESS AND THE INTERRUPT VECTOR MUST BE KNOWN BEFORE ANSWERING THE USER DIALOGUE. THE USER SHOULD ALSO KNOW WHETHER THE CPU IS A LSI11 (M7264), A LSI11/2 (M7270), OR A LSI11/23 (M8186). FINALLY THE USER MUST DECIDE THE TYPE OF TURNAROUND IN ORDER TO DETERMINE THE CONNECTOR (IF ANY) IS NECESSARY.

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

EXECUTION TIME IS DEPENDENT ON THE PROCESSOR SPEED AND THE TYPE OF LOOPBACK
THE FOLLOWING ARE THE TIMES TO COMPLETE THE 1ST PASS:

		RS423 (OR INTERNAL)	RS422
LSI11 (KD11-F M7264 MODULE):		10 SECONDS	30 SEC.
LSI11/2 (KD11-HA M7270 MODULE):		10 SECONDS	30 SEC.
LSI11/23(KDF11-AA M8186 MODULE):		7 SECONDS	5 SEC.

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

THERE IS NO MEMORY MANAGEMENT USE IN THIS DIAGNOSTIC.

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.

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                                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

                                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 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. ADDRESS : (O) 160010?

THIS IS THE ADDRESS AT WHICH THE DPV CSR REGISTERS RESIDE ON THE LSI-BUS. THE ALLOWABLE RANGE IS 160000-177776 (OCTAL), AND THE DEFAULT VALUE IS 160010.

2. VECTOR : (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. LOOPBACK -

```
                    0 = INTERNAL, 1 = RS423, 2 = RS422
                    3 = LOCAL MODEM LOOP, 4 = REMOTE MODEM LOOP (0)  1?

THIS IS THE USER SELECTED LOOPBACK  THE DEFAULT IS RS423.
THE FOLLOWING SHOULD BE CONSIDERED:
        A. INTERNAL LOOPBACK RUNS THE DIAGNOSTIC THROUGH THE
           USYNRT MAINTENANCE MODE LOOPBACK.  THE DRIVERS WILL
           NOT BE TESTED.  NO CONNECTOR IS REQUIRED.
        B. RS423 REQUIRES A H3260 ONBOARD CONNECTOR OR THE
           BC05C CABLE AND THE H3259 CONNECTOR.  THIS TURNAROUND
           WILL PROVIDE A 2K CLOCK FOR DIAGNOSTICS.  ALL TESTS
           SHOULD BE ABLE TO BE RUN ON ALL PROCESSORS.
        C. R2422 REQUIRES A MODIFIED H3260 ONBOARD CONNECTOR.
           THIS TURNAROUND WILL PROVIDE A 50K CLOCK FOR DIAGNOSTICS.
           THE TESTS RUN WILL DEPEND ON THE PROCESSOR.
           1. THE LSI11/23 SHOULD RUN ALL TESTS.
           2. THE LSI11/2  SHOULD RUN ALL TESTS EXCEPT TESTS 29-41.
           3. THE LSI11 WITHOUT PROCESSOR MEMORY REFRESH SHOULD
              RUN ALL TESTS EXCEPT TESTS 29-41.
           4. THE LSI11 WITH PROCESSOR MEMORY REFRESH SHOULD
              RUN ALL TESTS EXCEPT TESTS 29-43.
        D. LOOPBACK THROUGH THE MODEM SHOULD ONLY BE ATTEMPTED IF THE
           MODEM SUPPORTS THAT TYPE OF LOOBACK.


4.   IS THE PROCESSOR A LSI11/23 (M8186) (L) Y ?

THIS QUESTION WILL ALLOW THE DIAGNOSTIC TO SET UP A TIMING LOOP AND DETERMINE
IF A TEST CAN BE RUN IF A RS422 TURNAROUND IS SELECTED BY THE USER (SEE
QUESTION 3 ABOVE).  THE LOGICAL QUESTION REQUIRES A 'Y' OR 'N'. THE DEFAULT
IS 'Y'.
```

6.3.13 SOFTWARE PARAMETERS

NO SOFTWARE PARAMETER QUESTIONS ARE ASKED BY TIS DIAGNOSTIC

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 CIVING 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

PROGRAM DOCUMENT

```
                        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

                        SEE THE GLOBAL EQUATES SECTION FOR DEFINITIONS OF REGISTERS IN THE DPV
                        AND BIT DEFINITIONS WITHIN THOSE REGISTERS.



                        8.0 TEST DESCRIPTIONS

                        ;*******************************************************************************
                        ;*                  TEST 1 - DPV-11
                        ;* VERIFY THAT ADDRESSING THE 4 LSI-BUS CSRS DOES NOT CAUSE A NON-
                        ;* EXISTENT MEMORY TRAP.
                        ;*
                        ;* THE DPV IS AN COMMUNICATION DEVICE RESIDING ON A LSI-BUS.
                        ;* COMMUNICATION BETWEEN THE MAIN CPU AND THE DPV IS ACCOMPLISHED
                        ;* THROUGH A SET OF FOUR 16-BIT LSI-BUS CONTROL AND STATUS REGISTERS
                        ;* (CSRS).  THE FOUR REGISTERS ARE ASSIGNED ADDRESSES IN THE I/O PAGE
                        ;* FLOATING ADDRESS SPACE: 76XXX0 - 76XXX6
                        ;*
                        ;* AN ERROR IN THIS TEST COULD MEAN THAT THE DEVICE IS INCORRECTLY
                        ;* CONFIGURED, THAT THE ADDRESS IS WRONG OR THAT THE CRYSTAL CLOCK
                        ;* ON THE DPV IS NOT WORKING.  THE SHIFT REGISTER CLOCK IS NEEDED
                        ;* FOR THE LS164 (E15) IN ORDER TO PROVIDE THE BUS REPLY (BRFLY/L ON
                        ;* PIN AF2).
                        ;*******************************************************************************




                        ;*******************************************************************************
                        ;*                  TEST 2 - DPV-11
                        ;* DPV RESET
                        ;* RESET THE DPV AND ENSURE THAT ALL REGISTERS ARE IN THEIR
                        ;* PROPER INITIALIZATION STATE.  THE RESET IS ASYNCHRONOUS TO ALL
                        ;* DATA SET TIMING AND ANY DATA PORT ACCESSES. THE FOLLOWING
                        ;* WILL BE CHECKED BY THE $RESET SUBROUTINE:
                        ;*      1. ALL BITS IN THE DATA PORT REGISTERS ARE CLEARED.
                        ;*      2. ALL OUTPUT INDICATORS ARE CLEARED.
                        ;*      3. TRANSMIT BUFFER EMPTY (TBE) IS SET
                        ;*
                        ;* SUBTEST 1 - AFTER RESET, CHECK THAT MAINTENANCE MODE AND
                        ;*             TRANSMITTER CAN BE SET. ALSO CHECK THAT TRANSMITTER
                        ;*             BUFFER EMPTY (TBE) IS CLEARED WHEN TDSR IS ACCESSED
                        ;*             WITHOUT SETTING TRANSMITTER ENABLE.
                        ;* SUBTEST 2 - ON THE FIRST PASS ONLY, CHECK THAT A BUS RESET, DOES
                        ;*             A DPV11 RESET.
                        ;*
                        ;* NOTE: DATA MODE, CTS, RR (RECEIVER READY) AND IC (INCOMING CALL)
                        ;*       ARE UNAFFECTED BY A RESET.
                        ;*
                        ;*******************************************************************************
```

PROGRAM DOCUMENT
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PROGRAM DOCUMENT

```
                        ;*****************************************************************************
                        ;*                TEST 3 - DPV-11
                        ;* WRITE/READ DATA PATTERNS
                        ;* THIS TEST IS INTENDED TO TEST THE READ/WRITE BITS IN THE CSRS. THERE
                        ;* IS NO INTENTION TO CHECK THE USYNR/T; IT IS DESIRED TO ONLY CHECK THE
                        ;* READING AND WRITING OF THE CSRS.  IN ALL THE SUBTESTS THE BITS ARE
                        ;* CHECKED TOGETHER AND INDIVIDUALLY.
                        ;* SUBTEST 1 - RXCSR (LOW BYTE CSR0)
                        ;*             CHECK BITS 0-6
                        ;* SUBTEST 2 - PCR (HIGH BYTE CSR4)
                        ;*             CHECK BITS 0-7
                        ;* SUBTEST 3 - TDSR (LOW BYTE OF CSR6) - TRANSMIT DATA BUFFER
                        ;*             BITS 0-7
                        ;* SUBTEST 4 - TDSR (HIGH BYTE OF CSR6) - TRANSMIT STATUS REGISTER.
                        ;*             BITS 0-3
                        ;* SUBTEST 5 - TDSR  - CHECK BYTE OP SIGNAL FOR USYNRT
                        ;*
                        ;*****************************************************************************



                        ;*****************************************************************************
                        ;*                TEST 4 - DMR-11
                        ;* TRANSMIT ENABLE/ TRANSMIT ACTIVE
                        ;* AFTER A DEVICE RESET, SET TRANSMIT START OF MESSAGE (TSOM).  ENSURE
                        ;* THAT TRANSMIT ACTIVE (TXACT) IS SET.
                        ;*
                        ;* TXACT IS USED TO INDICATE THE CURRENT STATE OF THE TRANSMITTER
                        ;* DATA PATH.  THIS BIT WILL BE ASSERTED WHEN BOTH THE TRANSMITTER IS
                        ;* ENABLED AND TSOM ARE INTERNALLY SYNCHRONIZED.  TXACT WILL BE CLEARED
                        ;* UPON RESET OR WHEN THE TRANSMITTER ENTERS THE IDLE STATE.
                        ;*
                        ;*****************************************************************************



                        ;*****************************************************************************
                        ;*                TEST 5 - DPV-11
                        ;* TRANSMIT BUFFER EMPTY
                        ;* VERIFY THAT TBE (TRANSMIT BUFFER EMPTY) IS ASSERTED WHENEVER
                        ;* THE DEVICE IS RESET OR WHENEVER THE TDSR IS AVAILABLE FOR DATA.
                        ;* TBE IS CLEARED AFTER WRITING TO THE TDSR.
                        ;*
                        ;*****************************************************************************
```

```
                        ;*****************************************************************************
                        ;*              TEST 6 - DPV-11
                        ;* TRANSMIT INTERRUPT
                        ;* VERIFY THAT A TRANSMIT INTERRUPT IS RECEIVED WHEN TRANSMIT
                        ;* BUFFER EMPTY (TBE) IS ASSERTED.
                        ;*
                        ;*****************************************************************************




                        ;*****************************************************************************
                        ;*              TEST 7 - DPV-11
                        ;* RECEIVER ENABLE, RECEIVER ACTIVE AND RECEIVER DATA READY
                        ;*              MODE: BCP, 8 BIT CHARACTERS, MAINTENANCE MODE LOOPBACK
                        ;* ENABLE THE RECEIVER. AFTER TRANSMITTING A CHARACTER WAIT FOR
                        ;* RECEIVER DATA AVAILABLE AND CHECK THAT THE RECEIVER IS ACTIVE.
                        ;* AFTER CLEARING RECEIVER ENABLE  ENSURE THAT THE RECEIVER IS INACTIVE.
                        ;*
                        ;* RECEIVER ENABLE - CONTROLS THE OPERATION OF THE RECEIVER DATA PATH (RDP)
                        ;* RECEIVER ACTIVE - THIS OUTPUT IS ASSERTED WHEN THE RDP PRESENTS THE 1ST
                        ;*                   DATA CHARACTER OF A MESSAGE TO THE USYNRT.  IT REMAINS
                        ;*                   ASSERTED UNTIL THE RDP ENTERS THE IDLE STATE..
                        ;* RECEIVE DATA    - THIS OUTPUT IS SET WHEN THE RDP HAS ASSEMBLED A DATA
                        ;*                   CHARACTER THAT IS READY TO BE PRESENTED.
                        ;*****************************************************************************



                        ;*****************************************************************************
                        ;*              TEST 8 - DPV-11
                        ;* RECEIVE DATA INTERRUPT
                        ;*              MODE: BCP, 8 BIT CHARACTERS, MAINTENANCE MODE LOOPBACK
                        ;* ENABLE THE RECEIVER AND SET RECEIVER INTERRUPT. TRANSMIT DATA.
                        ;* CHECK THAT THE RECEIVE INTERUPT WAS GENERATED. AFTER THE INTERUPT
                        ;* WAS GENERATED DISABLE THE RECEIVER. CHECK THAT THE RECEIVER BECOMES
                        ;* INACTIVE.
                        ;*
                        ;*****************************************************************************
```

PROGRAM DOCUMENT

```
                        ;*****************************************************************************
                        ;*                TEST 9 - DPV-11
                        ;* THERE ARE 3 SUBTESTS IN THIS TEST WHICH ARE INTENDED TO CHECK
                        ;* RECEIVER STATUS.
                        ;* SUBTEST 1 -  REOM (RECEIVE END OF MESSAGE)
                        ;*              THIS SUBTEST WILL TRANSMIT A DATA MESSAGE THAT IS
                        ;*              ENDED WITH A TEOM (TRANSMIT END OF MESSAGE).  A
                        ;*              CHECK WILL BE MADE THAT THE RECEIVER GETS THE DATA
                        ;*              AND THAT THE REOM IS RECEIVED WHEN RECEIVE
                        ;*              STATUS IS AVAILABLE.
                        ;*
                        ;* SUBTEST 2 -  RECEIVER OVERRUN
                        ;*              THIS SUBTEST WILL TRANSMIT DATA CORRECTLY.  THE
                        ;*              RECEIVER AFTER BECOMING ACTIVE WILL NOT SERVICE
                        ;*              THE RECEIVE BUFFER CORRECTLY.  THIS SHOULD RESULT IN
                        ;*              A RECEIVE OVERRUN.  THIS SUBTEST WILL ENSURE THAT
                        ;*              WHEN RECEIVE STATUS IS AVAILABLE, THE RECEIVER OVERRUN
                        ;*              IS SET.
                        ;*
                        ;* SUBTEST 3 -  RECEIVER ABORT
                        ;*              THIS SUBTEST WILL TRANSMIT A DATA MESSAGE THAT IS ENDED
                        ;*              WITH A TRANSMIT ABORT.  THE SUBTEST WILL ENSURE THAT
                        ;*              RECEIVE STATUS AVAILABLE IS RECEIVED AND THAT THE
                        ;*              ABORT IS RECEIVED.
                        ;*
                        ;*****************************************************************************



                        ;*****************************************************************************
                        ;*                TEST 10 - DPV-11
                        ;* THIS TEST WILL ENSURE THAT INTERRUPTS MAY BE GENERATED WHEN
                        ;* RECEIVE STATUS IS AVAILABLE. EACH OF THE FOLLOWING SUBTESTS
                        ;* WILL GENERATE THE STATUS AS FOLLOWS:
                        ;* SUBTEST 1 -  REOM
                        ;* SUBTEST 2 -  RECEIVER OVERRUN
                        ;* SUBTEST 3 -  RECEIVER ABORT
                        ;*
                        ;*****************************************************************************
```

```
PROGRAM DOCUMENT
      1
      2                         ;*****************************************************************************
      3                         ;*                  TEST 11 - DPV-11
      4                         ;* RECEIVE AND TRANSMIT INTERRUPT
      5                         ;* TRANSMIT AND RECEIVE DATA USING INTERRUPT ROUTINES. THIS TEST
      6                         ;* WILL TRANSMIT 4 DATA CHARACTERS. AFTER ENSURING THAT A TRANSMIT
      7                         ;* INTERRUPT WAS COMPLETED, THE TEST WILL CHECK TO MAKE SURE THAT AT
      8                         ;* LEAST 1 RECEIVE INTERRUPT WAS GENERATED.
      9                         ;*
     10                         ;*****************************************************************************
     11
     12
     13
     14
     15                         ;*****************************************************************************
     16                         ;*                  TEST 12 - DPV-11
     17                         ;* MODEM STATUS
     18                         ;* IF A PROPER TURNAROUND (H3259 OR H3260) IS ON, THIS TEST WILL
     19                         ;* CHECK THAT THE FOLLOWING MODEM SIGNALS ARE TURNED AROUND
     20                         ;* 1. RTS (REQUEST TO SEND)     TURNED AROUND TO CTS (CLEAR TO SEND)
     21                         ;*                                            & RR  (RECEIVER READY)
     22                         ;* 2. DTR (DATA TERMINAL READY) TURNED AROUND TO IC  (INCOMING CALL OR RING)
     23                         ;* 3. SF  (SELECT FREQUENCY)    TURNED AROUND TO SQ  (SIGNAL QUALITY)
     24                         ;* 4. LL  (LOCAL LOOPBACK)      TURNED AROUND TO DM  (DATA MODE)
     25                         ;*
     26                         ;*****************************************************************************
     27
     28
     29
     30
     31                         ;*****************************************************************************
     32                         ;*                  TEST 13 - DPV-11
     33                         ;* MODEM STATUS INTERRUPT
     34                         ;* IF A PROPER TURNAROUND (H3259 OR H3260) IS ON, THIS TEST WILL CHECK
     35                         ;* THAT THE FOLLOWING SUBTESTS WORK CORRECTLY.
     36                         ;* SUBTEST 1 -  SET DTR (DATA TERMINAL READY), LOCAL LOOP (LL), RTS (REQUEST
     37                         ;*              TO SEND) WITH ONLY RECEIVE INTERRUPT ENABLED. ENSURE THAT AN
     38                         ;*              INTERRUPT IS NOT RECEIVED.
     39                         ;* SUBTEST 2 -  SET DTR, LL AND RTS WITH ONLY DATA SET INTERRUPT ENABLED.
     40                         ;*              ENSURE THAT AN INTERRUPT IS NOT RECEIVED.
     41                         ;* SUBTEST 3 -  SET DTR, LL AND RTS WITHOUT ANY INTERRUPTS ENABLED.  ENSURE
     42                         ;*              THAT AN INTERRUPT IS NOT RECEIVED.
     43                         ;* SUBTEST 4 -  SET RTS WITH RECEIVE AND DATA SET INTERRUPT ENABLED.  ENSURE
     44                         ;*              THAT AN INTERRUPT IS RECEIVED.
     45                         ;* SUBTEST 5 -  SET DTR WITH RECEIVE AND DATA SET INTERRUPT ENABLED.  ENSURE
     46                         ;*              THAT AN INTERRUPT IS RECEIVED.
     47                         ;* SUBTEST 6 -  SET LL WITH RECEIVE AND DATA SET INTERRUPT ENABLED.  ENSURE
     48                         ;*              THAT AN INTERRUPT IS RECEIVED.
     49                         ;*
     50                         ;*****************************************************************************
```

```
PROGRAM DOCUMENT
      1
      2                         ;*************************************************************************
      3                         ;*                TEST 14 - DPV-11
      4                         ;* RECEIVE AND MODEM STATUS INTERRUPTS
      5                         ;* CHANGE THE MODEM STATUS WHILE HANDLING A RECEIVE INTERRUPT.
      6                         ;* ENSURE THAT THE MODEM STATUS INTERRUPT IS RECEIVED.
      7                         ;* SUBTEST 1 -  CHANGE RTS DURING THE RECEIVE INTERRUPT.  ENSURE THAT
      8                         ;*              THE DATA SET INTERRUPT WAS RECEIVED.
      9                         ;* SUBTEST 2 -  CHANGE DTR DURING THE RECEIVE INTERRUPT.  ENSURE THAT
     10                         ;*              THE DATA SET INTERRUPT WAS RECEIVED.
     11                         ;* SUBTEST 3 -  CHANGE LL DURING THE RECEIVE INTERRUPT.  ENSURE THAT
     12                         ;*              THE DATA SET INTERRUPT WAS RECEIVED.
     13                         ;*
     14                         ;*************************************************************************
     15
     16
     17
     18
     19                         ;*************************************************************************
     20                         ;*                TEST 15 - DPV-11
     21                         ;* SUBTEST 1 - SECONDARY ADDRESS
     22                         ;*      SEGMENT 1 -     SELECT SECONDARY ADDRESS AND SEND THE CORRECT
     23                         ;*                      ADDRESS.  CHECK THE DATA IS PROPERLY RECEIVED.
     24                         ;*      SEGMENT 2 -     SELECT SECONDARY ADDRESS AND SEND A MESSAGE WITHOUT
     25                         ;*                      SENDING USING THE SECONDARY ADDRESS.  CHECK THAT A
     26                         ;*                      TIME OUT IS RECEIVED.
     27                         ;*
     28                         ;* SUBTEST 2 - ALL PARTIES ADDRESSING
     29                         ;*      SEGMENT 1 -     SELECT ALL PARTIES AND SECONDARY ADDRESS.  SEND A
     30                         ;*                      MESSAGE USING THE ALL PARTIES ADDRESS.  ENSURE THAT
     31                         ;*                      THE MESSAGE IS CORRECTLY RECEIVED.
     32                         ;*      SEGMENT 2 -     SELECT ALL PARTIES AND SECONDARY ADDRESS.  SEND A
     33                         ;*                      MESSAGE WITHOUT ALL PARTIES OR SECONDARY ADDRESS.
     34                         ;*                      CHECK THAT A TIME OUT IS RECEIVED.
     35                         ;*      SEGMENT 3 -     SELECT ALL PARTIES AND SECONDARY ADDRESS.  SEND A
     36                         ;*                      MESSAGE WITH A SECONDARY ADDRESS.  CHECK THAT A
     37                         ;*                      TIME OUT IS RECEIVED.
     38                         ;*
     39                         ;*************************************************************************
```

```
;*****************************************************************************
;*                TEST 16 - DPV-11
;* ABORT TEST
;* SUBTEST 1 -  ABORT WITH IDLE CLEAR. ABORT CHARACTERS TRANSMITTED WHEN
;*              THE ABORT BIT IS ASSERTED.
;*              SELECTED OPTIONS: BOP MODE, CRC-CCITT PRESET TO 1,
;*                                5 BIT CHARACTERS, MAINTENANCE MODE LOOPBACK.
;*
;* SUBTEST 2 -  ABORT WITH IDLE SET. FLAGS TRANSMITTED WHEN THE ABORT BIT
;*              IS ASSERTED.
;*              SELECTED OPTIONS: BOP MODE, NO ERROR CHECKING, IDLE SET,
;*                                5 BIT CHARACTERS, MAINTENANCE MODE LOOPBACK.
;*
;*****************************************************************************


;*****************************************************************************
;*                TEST 17 - DPV-11
;* EXTENDED CONTROL AND ADDRESSING TEST
;* CHECK THAT THE RECEIVER CAN RECOGNIZE EXTENDED ADDRESSING AND CONTROL
;* CHARACTERS.
;*      SELECTED OPTIONS: BOP MODE, CRC-CCITT PRESET TO 1,
;*                        3 BIT CHARACTERS, MAINTENANCE MODE LOOPBACK,
;*                        EXTENDED CONTROL AND ADDRESSING SELECTED
;*
;*****************************************************************************


;*****************************************************************************
;*                TEST 18 - DPV-11
;* TRANSMIT GO AHEAD
;* TERMINATE A MESSAGE USING TRANSMIT GO AHEAD.  CHECK THAT THE RECEIVE
;* ABORT BIT IS SET WHEN THE END OF MESSAGE IS RECEIVED.
;*      SELECTED OPTIONS: BOP MODE, CRC-CCITT PRESET TO 1, LOOP SET,
;*                        5 BIT CHARACTERS, MAINTENANCE MODE LOOPBACK.
;*
;*****************************************************************************


;*****************************************************************************
;*                TEST 19 - DPV-11
;* ASSEMBLED BIT COUNT
;* TRANSMIT VARIOUS BIT LENGTHS WHILE RECEIVING AN 8 BIT CHARACTER.
;* ENSURE THAT THE ASSEMBLED BIT COUNT (ABC) IS CORRECT UPON THE END
;* OF MESSAGE.
;*      SELECTED OPTIONS: BOP MODE, NO ERROR CHECKING, VARIOUS BIT
;*                        LENGTH CHARACTERS, MAINTENANCE MODE LOOPBACK.
;*
;*****************************************************************************
```

```
                        ;*****************************************************************************
                        ;*              TEST 20 - DPV-11
                        ;* SPECIAL SPACE SEQUENCE
                        ;* START A MESSAGE USING A SPECIAL SPACE SEQUENCE.  CHECK THAT THE
                        ;* MESSAGE IS CORRECTLY TRANSMITTED AND RECEIVED.
                        ;* NOTE: CERTAIN USYNRTS ONLY TRANSMIT A SPECIAL START SEQUENCE WHEN
                        ;*       TRANSMIT START AND END OF MESSAGE ARE SET BY A BYTE OPERATION.
                        ;*
                        ;*      SELECTED OPTIONS: BOP MODE, CRC-CCITT PRESET TO 1,
                        ;*                        5 BIT CHARACTERS, MAINTENANCE MODE LOOPBACK.
                        ;*
                        ;*****************************************************************************


                        ;*****************************************************************************
                        ;*              TEST 21 - DPV-11
                        ;* SYNCH CHARACTER
                        ;* CHECK THAT A SYNCH CHARACTER OF 271 CAN BE USED TO COMMENCE A MESSAGE.
                        ;* VERIFY THAT THE MESSAGE IS CORRECTLY TRANSMITTED AND RECEIVED.
                        ;*      SELECTED OPTIONS: BCP MODE, VRC-EVEN PARITY,
                        ;*                        7 BIT CHARACTERS, MAINTENANCE MODE LOOPBACK.
                        ;*
                        ;*****************************************************************************


                        ;*****************************************************************************
                        ;*              TEST 22 - DPV-11
                        ;* SYNCH FROM TRANSMIT DATA PATH
                        ;* TRANSMIT A MESSAGE USING THE SYNCH FROM THE TRANSMIT DATA PATH.
                        ;* VERIFY THAT THE MESSAGE IS CORRECTLY TRANSMITTED AND RECEIVED.
                        ;*      SELECTED OPTIONS: BCP MODE, VRC-ODD PARITY, IDLE SET
                        ;*                        5 BIT CHARACTERS, MAINTENANCE MODE LOOPBACK.
                        ;*
                        ;*****************************************************************************


                        ;*****************************************************************************
                        ;*              TEST 23 - DPV-11
                        ;* STRIP SYNCHS
                        ;* SEND MORE THAN 2 SYNCHS WITH THE STRIP SYNCH BIT SET. CHECK THAT
                        ;* THE MESSAGE IS CORRECTLY TRANSMITTED AND RECEIVED.
                        ;*      SELECTED OPTIONS: BCP MODE, VRC-ODD PARITY, STRIP SYNCH SET
                        ;*                        6 BIT CHARACTERS, MAINTENANCE MODE LOOPBACK.
                        ;*
                        ;*****************************************************************************
```

```
;*****************************************************************************
;*                TEST 24 - DPV-11
;* CRC-CCITT PRESET TO ONES.
;* CHECK TO ENSURE THAT THE ERROR CHECK BIT (BIT 15 OF RDSR) IS
;* SET WHEN AN ABORT IS RECEIVED.  IN BOP MODE THIS BIT IS SET WHEN THE
;* CRC IS IN ERROR.  THE ERROR CHECK BIT SHOULD BE ZERO WHEN REOM=1,
;* IF THE CRC WERE CORRECTLY RECEIVED. BY FORCING AN ABORT WE INTENTIONALLY
;* LOOK AT THE ERROR BIT WHEN IT SHOULD BE IN AN ERROR STATE.
;*      SELECTED OPTIONS: BOP MODE, CRC-CCITT PRESET TO 1, LOOP SET,
;*                        4 BIT CHARACTERS, MAINTENANCE MODE LOOPBACK.
;*
;*****************************************************************************



;*****************************************************************************
;*                TEST 25 - DPV-11
;* CRC-CCITT PRESET TO ZERO.
;* CHECK TO ENSURE THAT THE ERROR CHECK BIT (BIT 15 OF RDSR) IS
;* SET WHEN AN ABORT IS RECEIVED.  IN BOP MODE THIS BIT IS SET WHEN THE
;* CRC IS IN ERROR.  THE ERROR CHECK BIT SHOULD BE ZERO WHEN REOM=1,
;* IF THE CRC WERE CORRECTLY RECEIVED. BY FORCING AN ABORT WE INTENTIONALLY
;* LOOK AT THE ERROR BIT WHEN IT SHOULD BE IN AN ERROR STATE.
;*      SELECTED OPTIONS: BOP MODE, CRC-CCITT PRESET TO 0, LOOP SET,
;*                        8 BIT CHARACTERS, MAINTENANCE MODE LOOPBACK.
;*
;*****************************************************************************



;*****************************************************************************
;*                TEST 26 - DPV-11
;* CRC-16 PRESET TO 0
;*
;* SUBTEST 1 - CRC-16 ERROR
;* CHECK TO ENSURE THAT THE ERROR CHECK BIT (BIT 15 OF RDSR) IS
;* CLEAR IF THE RECEIVER IS SHUTDOWN BEFORE THE CRC IS RECEIVED.
;* IN BCP MODE THIS BIT IS CLEAR WHEN THE CRC IS IN ERROR.
;* THE ERROR CHECK BIT SHOULD BE SET WHEN THE LAST CHARACTER IS RECEIVED,
;* IF THE CRC WERE GOOD.
;*      SELECTED OPTIONS: BCP MODE, CRC-16 PRESET TO 0, LOOP SET,
;*                        8 BIT CHARACTERS, MAINTENANCE MODE LOOPBACK.
;*
;* SUBTEST 2 -  CRC-16 CHECK
;* CHECK THAT THE CORRECT CRC-16 IS RECEIVED FOR THE DATA MESSAGE.
;* THE CRC FOR THIS DATA MESSAGE WAS PREDETERMINED.
;*
;*****************************************************************************
```

```
                ;*****************************************************************
                ;*                TEST 27 - DPV-11
                ;* VRC ODD PARITY ERROR
                ;* BY SELECTING DIFFERENT CHARACTER LENGTHS IN THE RECEIVER AND
                ;* TRANSMITTER, CAUSE A PARITY ERROR TO OCCUR.
                ;*      SELECTED OPTIONS: BCP MODE, VRC-ODD PARITY, XMIT=7 &
                ;*                        RCV=6 BIT CHARACTERS, MAINTENANCE MODE LOOPBACK.
                ;*
                ;*****************************************************************

                ;*****************************************************************
                ;*                TEST 28 - DPV-11
                ;* VRC EVEN PARITY ERROR
                ;* BY SELECTING DIFFERENT CHARACTER LENGTHS IN THE RECEIVER AND
                ;* TRANSMITTER, CAUSE A PARITY ERROR TO OCCUR.
                ;*      SELECTED OPTIONS: BCP MODE, VRC-EVEN PARITY, XMIT=5 &
                ;*                        RCV=4 BIT CHARACTERS, MAINTENANCE MODE LOOPBACK.
                ;*
                ;*****************************************************************

                ;*****************************************************************
                ;*                TEST 29 - DPV-11
                ;* DATA TEST
                ;* TRANSMIT AND RECEIVE A COMPLETE DATA MESSAGE WITHOUT THE USE OF INTERRUPT
                ;* SERVICE ROUTINES. CHECK THAT THE DATA IS  CORRECT.
                ;*      SELECTED OPTIONS: BOP MODE, CRC-CCITT PRESET TO ONES,
                ;*                        8 BIT CHARACTERS, MAINTENANCE MODE LOOPBACK.
                ;*
                ;*****************************************************************

                ;*****************************************************************
                ;*                TEST 30 - DPV-11
                ;* BOP DATA TEST
                ;* TRANSMIT AND RECEIVE A COMPLETE DATA MESSAGE.  CHECK THAT THE
                ;* DATA IS CORRECTLY RECEIVED.
                ;*      SELECTED OPTIONS: BOP MODE, CRC-CCITT PRESET TO ZERO,
                ;*                        6 BIT CHARACTERS, USER SELECTED LOOPBACK.
                ;*
                ;*****************************************************************

                ;*****************************************************************
                ;*                TEST 31 - DPV-11
                ;* BOP DATA TEST
                ;* TRANSMIT AND RECEIVE A COMPLETE DATA MESSAGE.  CHECK THAT THE
                ;* DATA IS CORRECTLY RECEIVED.
                ;*      SELECTED OPTIONS: BOP MODE, CRC-CCITT PRESET TO ONES,
                ;*                        6 BIT CHARACTERS, USER SELECTED LOOPBACK.
                ;*
                ;*****************************************************************
```

```
;*****************************************************************
;*                TEST 32 - DPV-11
;* BOP DATA TEST
;* TRANSMIT AND RECEIVE A COMPLETE DATA MESSAGE.  CHECK THAT THE
;* DATA IS CORRECTLY RECEIVED.
;*      SELECTED OPTIONS: BOP MODE, CRC-CCITT PRESET TO ZERO,
;*                        7 BIT CHARACTERS, USER SELECTED LOOPBACK.
;*
;*****************************************************************

;*****************************************************************
;*                TEST 33 - DPV-11
;* BOP DATA TEST
;* TRANSMIT AND RECEIVE A COMPLETE DATA MESSAGE.  CHECK THAT THE
;* DATA IS CORRECTLY RECEIVED.
;*      SELECTED OPTIONS: BOP MODE, CRC-CCITT PRESET TO ONES,
;*                        8 BIT CHARACTERS, USER SELECTED LOOPBACK.
;*
;*****************************************************************

;*****************************************************************
;*                TEST 34 - DPV-11
;* BOP DATA TEST
;* TRANSMIT AND RECEIVE A COMPLETE DATA MESSAGE.  CHECK THAT THE
;* DATA IS CORRECTLY RECEIVED.
;* NOTE: CERTAIN USYNRTS ONLY TRANSMIT A SPECIAL START SEQUENCE WHEN
;*       TRANSMIT START AND END OF MESSAGE ARE SET BY A BYTE OPERATION.
;*      SELECTED OPTIONS: BOP MODE, CRC-CCITT PRESET TO ONES,
;*                        6 BIT CHARACTERS, USER SELECTED LOOPBACK.
;*
;*****************************************************************

;*****************************************************************
;*                TEST 35 - DPV-11
;* BOP DATA TEST
;* TRANSMIT AND RECEIVE A COMPLETE DATA MESSAGE.  CHECK THAT THE
;* DATA IS CORRECTLY RECEIVED.
;*      SELECTED OPTIONS: BOP MODE, CRC-CCITT PRESET TO ZEROS,
;*                        7 BIT CHARACTERS, USER SELECTED LOOPBACK.
;*
;*****************************************************************

;*****************************************************************
;*                TEST 36 - DPV-11
;* BOP DATA TEST
;* TRANSMIT AND RECEIVE A COMPLETE DATA MESSAGE.  CHECK THAT THE
;* DATA IS CORRECTLY RECEIVED.
;*      SELECTED OPTIONS: BOP MODE, CRC-CCITT PRESET TO ZERO, LOOP SET,
;*                        8 BIT CHARACTERS, USER SELECTED LOOPBACK.
;*
;*****************************************************************
```

```
                        ;*****************************************************************
                        ;*              TEST 37 - DPV-11
                        ;* BCP DATA TEST
                        ;* TRANSMIT AND RECEIVE A COMPLETE DATA MESSAGE.  CHECK THAT THE
                        ;* DATA IS CORRECTLY RECEIVED.
                        ;*      SELECTED OPTIONS: BCP MODE, VRC-ODD PARITY, IDLE BIT SET
                        ;*                        5 BIT CHARACTERS, USER SELECTED LOOPBACK.
                        ;*
                        ;*****************************************************************

                        ;*****************************************************************
                        ;*              TEST 38 - DPV-11
                        ;* BCP DATA TEST
                        ;* TRANSMIT AND RECEIVE A COMPLETE DATA MESSAGE.  CHECK THAT THE
                        ;* DATA IS CORRECTLY RECEIVED.
                        ;*      SELECTED OPTIONS: BCP MODE, VRC-EVEN PARITY,
                        ;*                        6 BIT CHARACTERS, USER SELECTED LOOPBACK.
                        ;*
                        ;*****************************************************************

                        ;*****************************************************************
                        ;*              TEST 39 - DPV-11
                        ;* BCP DATA TEST
                        ;* TRANSMIT AND RECEIVE A COMPLETE DATA MESSAGE.  CHECK THAT THE
                        ;* DATA IS CORRECTLY RECEIVED.
                        ;*      SELECTED OPTIONS: BCP MODE, CRC-16 PRESET TO ONES, STRIP SYNCHS,
                        ;*                        7 BIT CHARACTERS, USER SELECTED LOOPBACK.
                        ;*
                        ;*****************************************************************

                        ;*****************************************************************
                        ;*              TEST 40 - DPV-11
                        ;* BCP DATA TEST
                        ;* TRANSMIT AND RECEIVE A COMPLETE DATA MESSAGE.  CHECK THAT THE
                        ;* DATA IS CORRECTLY RECEIVED.
                        ;*      SELECTED OPTIONS: BCP MODE, CRC-16 PRESET TO ONES,
                        ;*                        8 BIT CHARACTERS, USER SELECTED LOOPBACK.
                        ;*
                        ;*****************************************************************
```

```
                        ;*****************************************************************************
                        ;*                TEST 41 - DPV-11
                        ;* DDCMP DATA TEST
                        ;* TRANSMIT AND RECEIVE A COMPLETE DATA MESSAGE USING THE
                        ;* DDCMP MESSAGE FORMAT.  CHECK THAT THE DATA IS CORRECTLY RECEIVED
                        ;* AND THAT THE CRC CHARACTERS ARE RECEIVED IN THE PROPER DDCMP
                        ;* ORDER.
                        ;*      SELECTED OPTIONS: BCP MODE, CRC-16 PRESET TO ONES, STRIP SYNCHS
                        ;*                        8 BIT CHARACTERS, USER SELECTED LOOPBACK.
                        ;*
                        ;*****************************************************************************

                        ;*****************************************************************************
                        ;*                TEST 42 - DPV-11
                        ;* BCP DATA TEST
                        ;* TRANSMIT AND RECEIVE A COMPLETE DATA MESSAGE.  CHECK THAT THE
                        ;* DATA IS CORRECTLY RECEIVED.
                        ;*      SELECTED OPTIONS: BCP MODE, CRC-16 PRESET TO ONES,
                        ;*                        8 BIT CHARACTERS, USER SELECTED LOOPBACK.
                        ;*
                        ;*****************************************************************************

                        ;*****************************************************************************
                        ;*                TEST 43 - DPV-11
                        ;* BOP DATA TEST
                        ;* TRANSMIT AND RECEIVE A COMPLETE DATA MESSAGE.  CHECK THAT THE
                        ;* DATA IS CORRECTLY RECEIVED.
                        ;*      SELECTED OPTIONS: BOP MODE, CRC-CCITT PRESET TO ONES,
                        ;*                        8 BIT CHARACTERS, USER SELECTED LOOPBACK.
                        ;*
                        ;*****************************************************************************
```

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 "TIME OUT" 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 :

```
DPV DVC FTL ERR 00002 ON UNIT 00 TST 020 SUB 000 PC:  004756
TIME OUT - DURING INTERRUPT EXERCISE
ERROR IN SUBROUTINE CALLED AT PC:  031706
RXCSR:  000160
RDSR :  000000
```

```
                                TXCSR:  122432
                                TDSR :  001402

                                DPV  EOP        1
                                     1 CUMULATIVE ERRORS
```

```
                002000                          .=2000
                                                .MCALL  SVC
002000                                          SVC                             ; INITIALIZE SUPERVISOR MACROS
002000                                  BGNMOD
                000001                  $LSTIN=  1      ;   LIST INSTRUCTIONS
                000001                  $LSTTAG= 1
                000001                  SVCINS=  1      ;   LIST INSTRUCTIONS, SHIFTED RIGHT
                000001                  SVCTST=  1      ;   LIST TEST TAGS, SHIFTED RIGHT
                000001                  SVCSUB=  1      ;   LIST SUBTEST TAGS, SHIFTED RIGHT
                000001                  SVCGBL=  1      ;   LIST GLOBAL TAGS, SHIFTED RIGHT
                000001                  SVCTAG=  1      ;   LIST OTHER TAGS, SHIFTED RIGHT
                                        ;       CHANGE THE VALUES OF THE SVC... SYMBOLS TO BE ZERO IF YOU WISH
                                        ;       TO ALIGN THE MACRO CALLS AND THEIR EXPANSIONS.  CHANGE THE
                                        ;       SYMBOLS TO BE MINUS-ONE TO NOT LIST THE EXPANSIONS.  YOU MAY
                                        ;       CHANGE THE SYMBOLS AT ANY POINT IN YOUR PROGRAM.
002000                                          POINTER BGNDU
```

PROGRAM HEADER

```
                                .SBTTL  PROGRAM HEADER
                                ;++
                                ;       THE PROGRAM HEADER MACRO CHARACTERIZES THIS DIAGNOSTIC. THE
                                ;       HEADER MACRO'S ARGUMENTS ARE FILE NAME, RELEASE LEVEL, PATCH
                                ;       DISPOSITION OF THE MOST RECENT PATCH, MAXIMUM TEST TIME IN SEC.,
                                ;       AND THE TYPE OF DIAGNOSTIC (0-SEQUENTIAL, 1-EXERCISER).  THESE
                                ;       ARGUMENTS ARE IN RESPECTIVE ORDER.
                                ;--


002000                                  HEADER CVDPV,A,0,200.,0
002000
002000  103                                                             L$NAME::
002001  126                                                                     .ASCII /C/
002002  104                                                                     .ASCII /V/
002003  120                                                                     .ASCII /D/
002004  126                                                                     .ASCII /P/
002005  000                                                                     .ASCII /V/
002006  000                                                                     .BYTE   0
002007  000                                                                     .BYTE   0
002010                                                                          .BYTE   0
002010  101                                                             L$REV::
002011                                                                          .ASCII  /A/
002011  060                                                             L$DEPO::
002012                                                                          .ASCII  /0/
002012  000000                                                          L$UNIT::
002014                                                                          .WORD   0
002014  000310                                                          L$TIML::
002016                                                                          .WORD   200.
002016  040204                                                          L$HPCP::
002020                                                                          .WORD   L$HARD
002020  000000                                                          L$SPCP::
002022                                                                          .WORD   0
002022  002254                                                          L$HPTP::
002024                                                                          .WORD   L$HW
002024  000000                                                          L$SPTP::
002026                                                                          .WORD   0
002026  040546                                                          L$LADP::
002030                                                                          .WORD   L$LAST
002030  000000                                                          L$STA::
002032                                                                          .WORD   0
002032  000000                                                          L$CO::
002034                                                                          .WORD   0
002034  000000                                                          L$DTYP::
002036                                                                          .WORD   0
002036  000000                                                          L$APT::
002040                                                                          .WORD   0
002040  002124                                                          L$DTP::
002042                                                                          .WORD   L$DISPATCH
002042  000000                                                          L$PRIO::
002044                                                                          .WORD   0
002044  000000                                                          L$ENVI::
002046                                                                          .WORD   0
002046  000000                                                          L$EXP1::
002050                                                                          .WORD   0
002050  003                                                             L$MREV::
002051  003                                                                     .BYTE   C$REVISION
                                                                                .BYTE   C$EDIT
```

```
002052
002052  000000
002054  000000
002056
002056  000000
002060
002060  003674
002062
002062  000000
002064
002064  000000
002066
002066  000000
002070
002070  000000
002072
002072  017544
002074
002074  000000
002076
002076  003702
002100
002100  104035
002102
002102  000000
002104
002104  015246
002106
002106  016376
002110
002110  016312
002112
002112  015240
002114
002114  000000
002116
002116  000000
002120
002120  000000
```

```
L$EF::
        .WORD   0
        .WORD   0
L$SPC::
        .WORD   0
L$DEVP::
        .WORD   L$DVTYP
L$REPP::
        .WORD   0
L$EXP4::
        .WORD   0
L$EXP5::
        .WORD   0
L$AUT::
        .WORD   0
L$DUT::
        .WORD   L$DU
L$LUN::
        .WORD   0
L$DESP::
        .WORD   L$DESC
L$LOAD::
        EMT     E$LOAD
L$ETP::
        .WORD   0
L$ICP::
        .WORD   L$INIT
L$CCP::
        .WORD   L$CLEAN
L$ACP::
        .WORD   L$AUTO
L$PRT::
        .WORD   L$PROT
L$TEST::
        .WORD   0
L$DLY::
        .WORD   0
L$HIME::
        .WORD   0
```

```
12
18
19
20
21
22                      .EVEN
23
24
25
26
27
28
```

```
                                        .SBTTL  DISPATCH TABLE

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

  002122                                      DISPATCH 43
  002122  000053                                                                  .WORD   43
  002124                                                                   L$DISPATCH::
  002124  017624                                                                  .WORD   T1
  002126  020234                                                                  .WORD   T2
  002130  020460                                                                  .WORD   T3
  002132  021210                                                                  .WORD   T4
  002134  021552                                                                  .WORD   T5
  002136  022004                                                                  .WORD   T6
  002140  022162                                                                  .WORD   T7
  002142  022414                                                                  .WORD   T8
  002144  022712                                                                  .WORD   T9
  002146  023720                                                                  .WORD   T10
  002150  025034                                                                  .WORD   T11
  002152  025300                                                                  .WORD   T12
  002154  025570                                                                  .WORD   T13
  002156  026500                                                                  .WORD   T14
  002160  027604                                                                  .WORD   T15
  002162  030514                                                                  .WORD   T16
  002164  031040                                                                  .WORD   T17
  002166  031212                                                                  .WORD   T18
  002170  031422                                                                  .WORD   T19
  002172  031672                                                                  .WORD   T20
  002174  032040                                                                  .WORD   T21
  002176  032224                                                                  .WORD   T22
  002200  032410                                                                  .WORD   T23
  002202  032574                                                                  .WORD   T24
  002204  032764                                                                  .WORD   T25
  002206  033152                                                                  .WORD   T26
  002210  033570                                                                  .WORD   T27
  002212  033760                                                                  .WORD   T28
  002214  034150                                                                  .WORD   T29
  002216  034546                                                                  .WORD   T30
  002220  034722                                                                  .WORD   T31
  002222  035076                                                                  .WORD   T32
  002224  035266                                                                  .WORD   T33
  002226  035440                                                                  .WORD   T34
  002230  035614                                                                  .WORD   T35
  002232  035776                                                                  .WORD   T36
  002234  036160                                                                  .WORD   T37
  002236  036362                                                                  .WORD   T38
  002240  036556                                                                  .WORD   T39
  002242  036760                                                                  .WORD   T40
  002244  037136                                                                  .WORD   T41
  002246  037410                                                                  .WORD   T42
  002250  037704                                                                  .WORD   T43
```

DISPATCH TABLE

19
20

DEFAULT HARDWARE P-TABLE

```
                        .SBTTL  DEFAULT HARDWARE P-TABLE

                        ;////////////////////////////////////////////////////////////////////////
                        ;/ THE DEFAULT HARDWARE P-TABLE CONTAINS DEFAULT VALUES FOR
                        ;/ THE TEST-DEVICE PARAMETERS.
                        ;////////////////////////////////////////////////////////////////////////

002252                          BGNHW   DFPTBL
002252  000004                                                          .WORD   L10000-L$HW/2
002254                                                          L$HW::
002254                                                          DFPTBL::

002254  160010                  .WORD   160010          ;DPV11 CSR UNIBUS ADDRESS
002256  000300                  .WORD      300          ;DPV11 INTERRUPT VECTOR
002260  000001                  .WORD        1          ;TURNAROUND (DEFAULT = RS423)
002262  000001                  .WORD        1          ;PROCESSOR TYPE (DEFAULT = LSI/23)

002264                          ENDHW
002264                                                  L10000:
```

GLOBAL EQUATES SECTION

```
                                .SBTTL  GLOBAL EQUATES SECTION

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

002264                                  EQUALS
                                ;
                                ; BIT DIFINITIONS
                                ;
100000                          BIT15== 100000
040000                          BIT14== 40000
020000                          BIT13== 20000
010000                          BIT12== 10000
004000                          BIT11== 4000
002000                          BIT10== 2000
001000                          BIT09== 1000
000400                          BIT08== 400
000200                          BIT07== 200
000100                          BIT06== 100
000040                          BIT05== 40
000020                          BIT04== 20
000010                          BIT03== 10
000004                          BIT02== 4
000002                          BIT01== 2
000001                          BIT00== 1
                                ;
001000                          BIT9==  BIT09
000400                          BIT8==  BIT08
000200                          BIT7==  BIT07
000100                          BIT6==  BIT06
000040                          BIT5==  BIT05
000020                          BIT4==  BIT04
000010                          BIT3==  BIT03
000004                          BIT2==  BIT02
000002                          BIT1==  BIT01
000001                          BIT0==  BIT00
                                ;
                                ; EVENT FLAG DEFINITIONS
                                ;   EF32:EF17 RESERVED FOR SUPERVISOR TO PROGRAM COMMUNICATION
                                ;
000040                          EF.START==      32.                     ; START COMMAND WAS ISSUED
000037                          EF.RESTART==    31.                     ; RESTART COMMAND WAS ISSUED
000036                          EF.CONTINUE==   30.                     ; CONTINUE COMMAND WAS ISSUED
000035                          EF.NEW==        29.                     ; A NEW PASS HAS BEEN STARTED
000034                          EF.PWR==        28.                     ; A POWER-FAIL/POWER-UP OCCURRED
                                ;
                                ;
                                ; PRIORITY LEVEL DEFINITIONS
                                ;
000340                          PRI07== 340
000300                          PRI06== 300
000240                          PRI05== 240
000200                          PRI04== 200
000140                          PRI03== 140
000100                          PRI02== 100
```

```
GLOBAL EQUATES SECTION
                000040                  PRI01== 40
                000000                  PRI00== 0
                                        ;
                                        ;OPERATOR FLAG BITS
                                        ;
                000004                  EVL==     4
                000010                  LOT==    10
                000020                  ADR==    20
                000040                  IDU==    40
                000100                  ISR==   100
                000200                  UAM==   200
                000400                  BOE==   400
                001000                  PNT==  1000
                002000                  PRI==  2000
                004000                  IXE==  4000
                010000                  IBE== 10000
                020000                  IER== 20000
                040000                  LOE== 40000
                100000                  HOE==100000
     9                                  ;;**********************************************************************
    10
    11                                  ;;**********************************************************************
    12                                  ;SWITCH REGISTER OPTIONS
    13
    14          100000                  SW15=   100000
    15          040000                  SW14=   40000
    16          020000                  SW13=   20000
    17          010000                  SW12=   10000
    18          004000                  SW11=   4000
    19          002000                  SW10=   2000
    20          001000                  SW09=   1000
    21          000400                  SW08=   400
    22          000200                  SW07=   200
    23          000100                  SW06=   100
    24          000040                  SW05=   40
    25          000020                  SW04=   20
    26          000010                  SW03=   10
    27          000004                  SW02=   4
    28          000002                  SW01=   2
    29          000001                  SW00=   1
    30
    31                                  ;;**********************************************************************
    32                                  ;;CSR AND STATUS WORD DEFINITIONS
    33
    34                                  ;;RXCSR - CSR0   (EXTERNAL REGISTER)  READ/WRITE BITS 0 - 6
    35
    36          000001                  SF=     BIT0            ;SELECT FREQUENCY.
    37          000001                  RL=     BIT0            ;REMOTE LOOPBACK - IF WIRE WRAPPED
    38                                                          ;SELECTED.
    39          000002                  DTR=    BIT1            ;DATA TERMINAL READY  R/W
    40          000004                  RTS=    BIT2            ;REQUEST TO SEND  R/W
    41          000010                  LL=     BIT3            ;LOCAL LOOPBACK
    42          000020                  RXENA=  BIT4            ;RECEIVER ENALBLE  R/W
    43          000040                  DSITEN= BIT5            ;DATA SET INTERRUPT ENABLE  R/W
    44          000100                  RXITEN= BIT6            ;RECEIVER INTERRUPT ENABLE  R/W
    45                                                          ;** BITS 7 - 15   READ ONLY **
    46          000200                  RDATRY= BIT7            ;RECEIVE DATA READY  READ ONLY
```

```
GLOBAL EQUATES SECTION
     47          000400                  SFR=     BIT8             ;SYNCH OR FLAG DETECT  READ ONLY
     48          001000                  DM=      BIT9             ;DATA MODE  READ ONLY
     49          002000                  RSTARY=  BIT10            ;RECEIVER STATUS READY  READ ONLY
     50          004000                  RXACT=   BIT11            ;RECEIVER ACTIVE  READ ONLY
     51          010000                  RR=      BIT12            ;RECEIVER READY  READ ONLY
     52          020000                  CTS=     BIT13            ;CLEAR TO SEND  READ ONLY
     53          040000                  IC=      BIT14            ;INCOMING CALL  READ ONLY
     54          100000                  DSCNG=   BIT15            ;DATA SET CHANGE  READ ONLY
     55
     56
     57                                  ;;PCSAR - CSR2   (INTERNAL USNYR/T REGISTERS 4 AND 5)  WRITE ONLY
     58
     59                                                           ;BITS 0-7 SYNCH CHARACTER OR SECONDARY STATION
     60                                                           ;ADDRESS.  LOWER BYTE OF THE PCSAR IS THE
     61                                                           ;SYNCH CHARACTER USED WITH IN BCP MODE   OR
     62                                                           ;THE SECONDARY ADDRESS USED IN BOP MODE.
     63
     64                                                           ;BITS 8-10 ERROR DETECTION SELECTION
     65          000000                  CCITT1=  0                ;CRC CCITT INITIALIZED TO ONES
     66          000400                  CCITT0=  BIT8             ;CRC CCITT INITIALIZED TO ZEROS
     67          001400                  CRC16=   BIT8!BIT9        ;CRC 16
     68          002000                  VRCO=    BIT10            ;VRC ODD PARITY
     69          002400                  VRCE=    BIT8!BIT10       ;VRC EVEN PARITY
     70          003400                  NOERR=   BIT8!BIT9!BIT10  ;ALL ERROR DETECTION INHIBITED.
     71          001000                  NONE1=   BIT9             ;NOT USED
     72          003000                  NONE2=   BIT9!BIT10       ;NOT USED
     73
     74          004000                  IDLE=    BIT11            ;IDLE MODE SELECT
     75          010000                  SECADR=  BIT12            ;SECONDARY ADDRESS SELECT
     76          020000                  SSYNCH=  BIT13            ;STRIP SYNCH - BCP
     77          020000                  LOOP=    BIT13            ;LOOP MODE - BOP
     78          040000                  PROTO=   BIT14            ;PROTOCOL SELECT.
     79          100000                  APA=     BIT15            ;ALL PARTIES ADDRESSED.
     80
     81
     82                                  ;;RDSR  - CSR2   (INTERNAL USNYR/Y REGISTERS 0 AND 1)  READ ONLY
     83
     84                                                           ;BITS 0-7 RECEIVE DATA BUFFER
     85          000400                  RSOM=    BIT8             ;RECEIVED START OF MESSAGE.
     86          001000                  REOM=    BIT9             ;RECEIVED END OF MESSAGE.
     87          002000                  RABORT=  BIT10            ;RECEIVER ABORT OR GO AHEAD
     88          004000                  ROVER=   BIT11            ;RECEIVER OVERRUN.
     89                                                           ;BITS 12-14 ASSEMBLED BIT COUNT (ABC)
     90          000000                  ALL=     0                ;ALL BITS VALID
     91          010000                  ONE=     BIT12            ;ONE BIT VALID
     92          020000                  TWO=     BIT13            ;TWO BITS VALID
     93          030000                  THREE=   BIT12!BIT13      ;THREE BITS VALID
     94          040000                  FOUR=    BIT14            ;FOUR BITS VALID
     95          050000                  FIVE=    BIT12!BIT14      ;FIVE BITS VALID
     96          060000                  SIX=     BIT13!BIT14      ;SIX BITS VALID
     97          070000                  SEVEN=   BIT12!BIT13!BIT14 ;SEVEN BITS VALID
     98
     99          100000                  ERR=     BIT15            ;ERROR CHECK
    100
    101
    102                                  ;;TXCSR - CSR4   (EXTERNAL LO BYTE  -  INTERNAL 7 HI BYTE) READ/WRITE
    103
```

```
GLOBAL EQUATES SECTION
104          000001                  RESET=  BIT0            ;DEVICE RESET  - WRITE ONLY
105          000002                  TXACT=  BIT1            ;TRANSMITTER ACTIVE - READ ONLY
106          000004                  TBE=    BIT2            ;TRANSMITTER BUFFER EMPTY - READ ONLY
107          000010                  MM=     BIT3            ;MAINTENANCE MODE - R/W
108          000020                  TXENA=  BIT4            ;TRANSMITTER ENABLE - R/W
109          000040                  SQ=     BIT5            ;SIGNAL QUALITY -READ ONLY
110          000040                  TM=     BIT5            ;TEST MODE - READ ONLY  WIRE WRAPPED FOR
111                                                          ;TEST MODE
112          000100                  TXIE=   BIT6            ;TRANSMIT INTERRUPT ENABLE - R/W
113
114                                  ;;PCR   - HI BYTE CSR4 (INTERNAL USNYR/T REGISTER 7)
115
116          000010                  EXCON=  BIT3            ;EXTENDED CONTROL FIELD
117          000020                  EXADD=  BIT4            ;EXTENDED ADDRESS FIELD.
118
119                                  ;;TDCSR - CSR6   (INTERNAL USNYR/T REGISTERS 7 AND 7) READ/WRITE
120
121                                                          ;BITS 0-7 TRANSMITTER DATA
122          000400                  TSOM=   BIT8            ;TRANSMIT START OF MESSAGE - R/W
123          001000                  TEOM=   BIT9            ;TRANSMIT END OF MESSAGE - R/W
124          002000                  TXABO=  BIT10           ;TRANSMIT ABORT - R/W
125          004000                  TGA=    BIT11           ;TRANSMIT GO AHEAD - R/W
126                                                          ;BITS 12 - 14 RESERVED
127          100000                  TERR=   BIT15           ;TRANSMIT DATA LATE ERROR. - READ ONLY
128
129
130
131                                  ;;**************************************************************************
132                                  ;;**************************************************************************
133                                  ; MISC. EQUATES
134
135          000226                  SYN=    226             ;DDCMP SYNCH CHARACTER
136          000207                  RETURN= 207             ;RETURN FROM SUB.     [=  JSR PC]
137          100000                  BOP=    BIT15           ;BIT SET IN MODE WHEN IN BOP MODE
138          000015                  CR=     15              ;ASCII CARRIAGE RETURN
139          000012                  LF=     12              ;ASCII LINE FEED
140          000332                  CRCLO=  332             ;LOW BYTE OF CRC IN TEST 26.
141          000266                  CRCHI=  266             ;HIGH BYTE OF CRC IN TEST 26.
142
```

GLOBAL DATA SECTION

```
                                .SBTTL  GLOBAL DATA SECTION

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



                                ;;**********************************************************************
                                ;DPV11 VECTOR AND REGISTER INDIRECT POINTERS
002264  000000                  RCVEC:  .WORD   0               ;DPV11 RECEIVER INTERRUPT VECTOR
002266  000000                  XMTVEC: .WORD   0               ;DPV11 TRANSMITTER INT. VECTOR
002270  000000                  CSR0:   .WORD   0               ;POINTER TO DPV11 CSR0
002272  000000                  CSR2:   .WORD   0               ;POINTER TO DPV11 CSR2
002274  000000                  CSR4:   .WORD   0               ;POINTER TO DPV11 CSR4
002276  000000                  CSR6:   .WORD   0               ;POINTER TO DPV11 CSR6
002300  000000                  CSR1:   .WORD   0               ;POINTER TO HIGH BYTE OF CSR0
002302  000000                  CSR3:   .WORD   0               ;POINTER TO HIGH BYTE OF CSR2
002304  000000                  CSR5:   .WORD   0               ;POINTER TO HIGH BYTE OF CSR4
002306  000000                  CSR7:   .WORD   0               ;POINTER TO HIGH BYTE OF CSR6

        002270                  RXCSR=  CSR0                    ;RECEIVER CSR (READ/WRITE)
        002272                  PCSAR=  CSR2                    ;PARAMETER CONTROL SYNCH/ADDRESS REG.
                                                                ;(WRITE ONLY)
        002272                  RDSR=   CSR2                    ;RECEIVE DATA/STATUS REGISTER (READ ONLY)
        002274                  TXCSR=  CSR4                    ;TRANSMITTER CSR (READ/WRITE)
        002276                  TDSR=   CSR6                    ;TRANSMIT DATA/STATUS REGISTER (READ ONLY)
        002304                  PCR=    CSR5                    ;PCR = PARAMETER CONTROL REGISTER

                                ;;OTHER HARDWARE PARAMETERS

002310  000000                  TURN:   .WORD   0               ;TURN AROUND TYPE (0-7)
002312  000000                  CPU:    .WORD   0               ;PROCESSOR TYPE (0 = LSI 11, 1 = LSI11/2,
                                                                ;                3 = LSI 11/23)


                                ;;**********************************************************************
                                ;PROGRAM CONTROL PARAMETERS



002314  000000                  FRSTIM: .WORD   0               ;FLAG=0 IF PROGRAM JUST LOADED
002316  000000                  FRSPAS: .WORD   0               ;FLAG=0 IF FIRST PASS AFTER LOAD
002320  000000                  STARES: .WORD   0               ;FLAG=0 IF 1ST TIME THRU AFTER STA OR RES



                                ;;**********************************************************************
                                ;PROGRAM VARIABLES

                                ;* MISCELLANEOUS STORAGE
002322  000000                  ABORT:  .WORD   0               ;FLAG TO ALLOW AN ABORT TO BE ISSUED.
002324  000000                  BITS:   .WORD   0               ;BITS TO BET SET IN THE CSR REGISTER
002326  000000                  COUNTER:.WORD   0               ;COUNTER FOR # OF CHARACTERS TO RCV. (RDATA2)
002330  000000                  DATA:   .WORD   0               ;COUNTER FOR # OF DATA CHARATERS TRANSMITTED.
002332  000000                  ERROR:  .WORD   0               ;ERROR STORAGE
002334  000000                  EXERR:  .WORD   0               ;FLAG THAT AN ERROR IS EXPECTED IN DATA
```

```
GLOBAL DATA SECTION
     58 002336  000000                FLAG:    .WORD   0              ;SCRATCH WORD USED FOR MISC. FLAG IN SUB.
     59 002340  000000                HEADER:  .WORD   0              ;FLAG USED TO MARK DDCMP HEADER.
     60 002342  000000                IPCR:    .WORD   0              ;IMAGE OF PCR
     61 002344  000000                IPCSAR:  .WORD   0              ;IMAGE OF PCSAR
     62 002346  000000                IRXCSR:  .WORD   0              ;IMAGE OF RXCSR
     63 002350  000000                IRDSR:   .WORD   0              ;IMAGE OF RDSR.
     64 002352  000000                LENGTH:  .WORD   0              ;CHARACTER LENGTH.
     65 002354  000000                LOGDEV:  .WORD   0              ;LOGICAL DEVICE NUMBER
     66 002356  000000                MAINT:   .WORD   0              ;MAINTENANCE MODE LOOPBACK FLAG
     67 002360  000000                MCFLAG:  .WORD   0              ;WORD USED IN TO TRACK MODEM CONTROL INT.
     68 002362  000000                MODE:    .WORD   0              ;PROTOCOL TYPE
     69 002364  000000                NESTPC:  .WORD   0              ;FLAG TO NOTIFY WHEN A SUBR IS NESTED
     70 002366  000000                NXMFLG:  .WORD   0              ;WORD USED WHEN ADDRESS IS NXM.
     71 002370  000000                OVER:    .WORD   0              ;FLAG TO ALLOW RECEIVE OVERRUN.
     72 002372  000000                PSTACK:  .WORD   0              ;CONTAINS BASE LEVEL PROGRAM SP
     73 002374  000000                REG:     .WORD   0              ;STORAGE OF A CSR ADDRESS
     74 002376  000000                RFLAG:   .WORD   0              ;WORD USED IN RECEIVE ROUTINE.
     75 002400  000000                RSAVE:   .WORD   0              ;TEMPORARY LOCATION TO SAVE RDSR ON INTERRUPT
     76 002402  000000                RXINI:   .WORD   0              ;RECEIVER INITIALIZATION
     77 002404  000000                RXINIT:  .WORD   0              ;RECEIVER INITIALIZATION WITH INT ENABLED.
     78 002406  000000                RXMINI:  .WORD   0              ;RECEIVER INIT WITH MAINTENANCE LOOPBACK.
     79 002410  000000                SAVE:    .WORD   0              ;SCRATCH WORD USED FOR MISC. STORAGE IN SUB.
     80 002412  000000                SAVTIM:  .WORD   0              ;STORAGE TO SAVE TIMER VALUE
     81 002414  000000                START:   .WORD   0              ;CONTER FOR # OF START CHARACTERS TO XMIT.
     82 002416  000000                SUBRPC:  .WORD   0              ;PC OF SUBR CALL FOR ERROR REPORTS
     83 002420  000000                TEMP:    .WORD   0              ;SCRATCH WORD USED FOR MISC. STORAGE IN SUB.
     84 002422  000000                TEND:    .WORD   0              ;TRANSMIT END
     85 002424  000000                TFLAG:   .WORD   0              ;WORD USED IN TRANSMIT INTERRUPT ROUTINE
     86 002426  000000                TIMEO:   .WORD   0              ;FLAG TO MARK TIME OUT IN $DATA SUBROUTINE.
     87 002430  000000                TIMER:   .WORD   0              ;TIMER VALUE
     88 002432  000000                TOGGLE:  .WORD   0              ;FLAG TO ALLOW TOGGLE OF RTS IN TEST.
     89 002434  000000                TSTART:  .WORD   0              ;TRANSMIT START
     90 002436  000000                TXINI:   .WORD   0              ;TRANSMITTER INITIALIZATION
     91 002440  000000                TXINIT:  .WORD   0              ;TRANSMITTER INITIALIZATION WITH INT ENABLED.
     92 002442  000000                TXMINI:  .WORD   0              ;TRANSMITTER INIT WITH MAINTENANCE LOOPBACK
     93
     94
     95
     96
     97
     98
     99
    100                                      .EVEN
    101
    102                              ;;*****************************************************************************
    103                              ;;*****************************************************************************
    104                              ;;MODEM CONTROL
    105
    106 002444                       MODEM:   .BLKW   10.             ;BUFFER AREA FOR MODEM STATUS
    107
    108                              ;;*****************************************************************************
    109                              ;;*****************************************************************************
    110                              ;;BUFFER AREA
    111
    112 002470  000000               XTYPE:   .WORD   0              ;POINTER TO DATA TYPE TO LOAD INTO XMIT BUFFER
    113 002472  000000               XCOUNT:  .WORD   0              ;# OF CHARACTERS TO TRANSMIT.
    114 002474  000000               ECOUNT:  .WORD   0              ;# OF CHARACTERS FOR END OF MSG. IN BCP MODE.
```

```
GLOBAL DATA SECTION
    115 002476  000000                  XMITD:  .WORD   0               ;# OF CHARACTERS TRANSMITTED.
    116 002500  000000                  RCOUNT: .WORD   0               ;# OF CHARACTERS RECEIVED.
    117
    118
    119                                 ;;*************************************************************************
    120                                 ;               ** CCITT PSUEDO-RANDOM TEST PATTERN **
    121                                 ; THE FOLLOWING 32 WORDS TRANSLATE INTO A 512 BIT PATTERN
    122                                 ; THAT WAS GENERATED ACCORDING TO CCITT RECOMMENDATION V.52.  THIS
    123                                 ; PATTERN WAS GENERATED BY A 9 BIT SHIFT REGISTER (INITIALIZED
    124                                 ; AS 1S) WHOSE 5TH AND 9TH BITS ARE XORED.  THIS XOR RESULT IS SHIFTED
    125                                 ; INTO THE 1ST BIT OF THE REGISTER AS THE REGISTER IS SHIFTED RIGHT.
    126                                 ; THE 9TH BIT (OR BIT SHIFTED OUT) IS SHIFTED INTO THE BIT PATTERN.
    127                                 ; NOTE: CCITT RECOMMENDED 511 BITS, I'VE EXTENDED THIS BY 1 BIT TO END
    128                                 ; ON A WORD BOUNDARY.
    129 002502                          $CCITT:
    130 002502  177603  157427  031011          .WORD   177603,157427,031011
    131 002510  047321  163715  105221          .WORD   047321,163715,105221
    132 002516  143325  142304  040041          .WORD   143325,142304,040041
    133 002524  014116  052606  172334          .WORD   014116,052606,172334
    134 002532  105025  123754  111337          .WORD   105025,123754,111337
    135 002540  111523  030030  145064          .WORD   111523,030030,145064
    136 002546  137642  143531  063617          .WORD   137642,143531,063617
    137 002554  135015  066730  026575          .WORD   135015,066730,026575
    138 002562  052012  053627  070071          .WORD   052012,053627,070071
    139 002570  151172  165044  031605          .WORD   151172,165044,031605
    140 002576  166632  016741                  .WORD   166632,016741
    141
    142                                 ;;*************************************************************************
    143                                 ;; ALPHANUMERIC DATA
    144
    145 002602      101     102     103 ALPHA:  .ASCIZ  /ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789/
        002605      104     105     106
        002610      107     110     111
        002613      112     113     114
        002616      115     116     117
        002621      120     121     122
        002624      123     124     125
        002627      126     127     130
        002632      131     132     060
        002635      061     062     063
        002640      064     065     066
        002643      067     070     071
        002646      000
    146         000045              ACOUNT= .-ALPHA                 ;CHARACTER COUNT
    147                                 .EVEN
    148
    149                                 ;;*************************************************************************
    150                                 ;; DDCMP BUFFER
    151
    152 002650      201             DDCMP:  .BYTE   201             ;SOH (START OF HEADER)
    153 002651      064     000             .BYTE   64,0            ;COUNT AND FLAGS (BITS 0 AND 1 FLAGS)
    154 002653      000                     .BYTE   0               ;RESPONSE NUMBER
    155 002654      000                     .BYTE   0               ;TRANSMIT NUMBER
    156 002655      001                     .BYTE   1               ;STATION ADDRESS
    157         000006              DDCMP1= .-DDCMP
    158                                                             ;2 BYTES OF CRC16
    159 002656      104     104     103 DDMSG:  .ASCII  /DDCMP MESSAGE/
```

```
        002661      115     120     040
        002664      115     105     123
        002667      123     101     107
        002672      105
    160                                                     ;2 BYTES OF CRC16
    161         000015              DDCMP2= .-DDMSG
    162
    163                             ;;**********************************************************************
    164                             ;; TRANSMIT BUFFER
    165
    166 002673                      XMTBUF: .BLKB   256.
    167
    168                             ;;**********************************************************************
    169                             ;; RECEIVE BUFFER
    170
    171 003273                      RCVBUF: .BLKB   256.            ;256. BYTE BUFFER
    172         000400              RSIZE=  .-RCVBUF
    173                                     .EVEN
    174
    175
```

```
                                        .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
                                        ;;*******************************************************************
003674                                          DEVTYP  <DPV11>
003674                                                                          L$DVTYP::
003674     104     120     126                                                          .ASCIZ  /DPV11/
003677     061     061     000
                                                                                        .EVEN

                                        ;;*********************************************************************
                                        ;* TITLE OF PROGRAM
                                        ;;*********************************************************************
003702                                          DESCRIPT   <DIAGNOSTIC TESTS>
003702                                                                          L$DESC::
003702     104     111     101                                                          .ASCIZ  /DIAGNOSTIC TESTS/
003705     107     116     117
003710     123     124     111
003713     103     040     124
003716     105     123     124
003721     123     000
                                                                                        .EVEN



                                        ;
                                        ; FORMAT STATEMENTS USED IN PRINT CALLS
                                        ;
```

```
                        .SBTTL  GLOBAL SUBROUTINES

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


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

                        ;;*************************************************************************
                        ; CALL MACRO - CALL ROUTINE = JSR PC, ROUTINE
                        ;              (NOTE: RETURN IS  EQUATED TO A RTS PC)
                        ;;*************************************************************************
                                .MACRO  CALL    ROUTIN
                                .IF     B, ROUTIN
                                .ERROR  ROUTINE; ## MISSING ROUTINE-EXPANSION ABORT ##
                                .MEXIT
                                .ENDC
                                JSR     PC,ROUTIN
                                .ENDM


                        ;;*************************************************************************
                        ; PUSH REGS MACRO
                        ;
                        ;;*************************************************************************
                                .MACRO  PUSH REGS
                                .IRP    X,<REGS>
                                MOV     X,-(SP)         ;PUSH REG ON STACK.
                                .ENDR
                                .ENDM   PUSH

                        ;;*************************************************************************
                        ; POP REGS MACRO
                        ;
                        ;;*************************************************************************
                                .MACRO  POP REGS
                                .IRP    X,<REGS>
                                MOV     (SP)+,X         ;POP REG OFF STACK.
                                .ENDR
                                .ENDM   POP


                        ;;*************************************************************************
                        ; WAIT MACRO
                        ;
                        ;;*************************************************************************

                                .MACRO  WAIT    $BIT,ADDRESS
                                .IF     B, $BIT
                                .ERROR ROUTINE;  ## MISSING ROUTINE-EXAPNSION ABORT ##
                                .MEXIT
                                .ENDC
```

```
                        .NLIST
                        .LIST ME
                        .LIST

                                                ;******** MACRO EXPANSION ********
                        .IF     B, ADDRESS
                        .IF     IDN $BIT, TBE
                        JSR     PC,$WAIT        ;CALL WAIT ROUTINE -
                                .WORD   TBE     ;WAIT FOR TBE TO BE SET
                                .WORD   TXCSR   ;IN TRANSMITTER  CSR.
                        .IFF
                        JSR     PC,$WAIT        ;CALL WAIT ROUTINE -
                                .WORD   $BIT    ;WAIT FOR BIT TO BE SET
                                .WORD   RXCSR   ;IN RECEIVER  CSR.
                        .ENDC
                        .IFF
                        JSR     PC,$WAIT        ;CALL WAIT ROUTINE -
                                .WORD   $BIT    ;WAIT FOR BIT TO BE SET
                                .WORD   ADDRESS ;IN THE GIVEN ADDRESS.
                        .ENDC
                                                ;**********************************

                        .NLIST ME
                        .ENDM


;;*****************************************************************************
; DELAY MACRO
;
;;*****************************************************************************

                .MACRO  $DELAY  $TIME
                .IF     B, $TIME
                .ERROR ROUTINE;  ## MISSING ROUTINE-EXAPNSION ABORT ##
                .MEXIT
                .ENDC

                .NLIST
                .LIST ME
                .LIST

                                        ;******** MACRO EXPANSION ********
                JSR     PC,$DLAY        ;CALL DELAY SUBROUTINE
                        .WORD   $TIME   ;NUMBER OF DELAY LOOPS
                                        ;**********************************

                .NLIST ME
                .ENDM
```

GLOBAL SUBROUTINES

```
                        ;*****************************************************************************
                        ;*****************************************************************************
                        ;
                        ;                       SUBROUTINE $WAIT
                        ;
                        ;             FUNCTION -  TO WAIT FOR A BIT TO BE SET IN A GIVEN
                        ;                         ADDRESS (USUALLY A DPV REGISTER).
                        ;
                        ;       CALLING FORMAT:         JSR     PC,$WAIT
                        ;                               .WORD           ;BIT
                        ;                               .WORD           ;ADDRESS
                        ;
                        ;       ENTRY CONDITIONS -
                        ;
                        ;       EXIT CONDITIONS  - EXIT WHEN BIT SET OR UPON TIME OUT.
                        ;                          IF TIME OUT, PRINT TIME OUT ERROR.
                        ;
                        ;       CALLED BY        - TESTS 4,5,7
                        ;
                        ;    REGISTERS DESTROYED - R0-R2 SAVED AND RESTORED
                        ;
                        ;*****************************************************************************
                        ;*****************************************************************************
003724                  $WAIT:
003724  011637  002416          MOV     (SP),SUBRPC     ;SAVE THE PC THAT CALLED THE ROUTINE.
003730  162737  000004  002416  SUB     #4,SUBRPC       ;CORRECT THE PC.
003736  017637  000000  002324  MOV     @(SP),BITS      ;SAVE THE BITS THAT WE ARE CHECKING.
003744  062716  000002          ADD     #2,(SP)         ;UPDATE THE ADDRESS ON THE STACK.
003750  017637  000000  002374  MOV     @(SP),REG       ;SAVE THE ADDRESS OF THE CSR POINTER
003756  017737  176412  002374  MOV     @REG,REG        ;SAVE THE ACTUAL CSR ADDRESS.
003764  062716  000002          ADD     #2,(SP)         ;UPDATE THE ADDRESS ON THE STACK.
003770                          PUSH    <R2,R1,R0>      ;PUSH REGS ON THE STACK
003776  005000                  CLR     R0              ;USE R0 AS A LOOP TIMER.
                        ;
004000                  10$:
004000  017701  176370          MOV     @REG,R1         ;SAVE THE CONTENTS OF THE CSR.
004004  033701  002324          BIT     BITS,R1         ;IS THE BIT SET ?
004010  001026                  BNE     20$             ;BRANCH IF SET
004012                          BREAK                   ;BREAK FOR SUPERVISOR.
004012  104422                                                  TRAP    C$BRK
004014  005300                  DEC     R0              ;DECREMENT TIMER
004016  001370                  BNE     10$             ;CONTINUE IF TIMER NOT EXPIRED.
004020  010102                  MOV     R1,R2           ;SAVE EXPECTED RESULTS FOR ERROR MESSAGE.
004022  053702  002324          BIS     BITS,R2         ;SET THE EXPECTED BITS.
004026                          ERRDF   0,EMG1,ERRG12   ;PRINT TIME OUT ERROR.
004026  104455                                                  TRAP    C$ERDF
004030  000000                                                  .WORD   0
004032  013336                                                  .WORD   EMG1
004034  010074                                                  .WORD   ERRG12
004036  032737  000004  002324  BIT     #TBE,BITS       ;WERE WE WAITING FOR TBE?
004044  001410                  BEQ     20$             ;IF NOT, EXIT.
004046                          PRINTB  #FMS1           ;SUGGEST THAT THE XMIT CLOCK IS INOP.
004046  012746  004102                                          MOV     #FMS1,-(SP)
004052  012746  000001                                          MOV     #1,-(SP)
004056  010600                                                  MOV     SP,R0
```

```
GLOBAL SUBROUTINES
        004060  104414                                                          TRAP    C$PNTB
        004062  062706  000004                                                  ADD     #4,SP
     50 004066                          20$:
     51 004066                                  POP     <R0,R1,R2>      ;POP REGISTERS OFF STACK.
     52 004074  005037  002416                  CLR     SUBRPC
     53
     54 004100  000207                          RETURN
     55
     56 004102     045     101     050  FMS1:  .ASCIZ  /%A(CHECK THE XMIT CLOCK)%N/
        004105     103     110     105
        004110     103     113     040
        004113     124     110     105
        004116     040     130     115
        004121     111     124     040
        004124     103     114     117
        004127     103     113     051
        004132     045     116     000
     57                                 .EVEN
     58
```

GLOBAL SUBROUTINES

```
                        ;*****************************************************************************
                        ;*****************************************************************************
                        ;
                        ;                       SUBROUTINE $RESET
                        ;
                        ;               FUNCTION -  TO PERFORM A MASTER RESET AND TO CHECK THAT
                        ;                           THE DPV IS IN THE PROPER INIT STATE.
                        ;
                        ;       CALLING FORMAT:         JSR     PC,$RESET
                        ;
                        ;       ENTRY CONDITIONS -
                        ;
                        ;       EXIT CONDITIONS  - DEVICE IS RESET CORRECTLY OR AN ERROR IS REPORTED
                        ;
                        ;       CALLED BY        - TESTS 2-43
                        ;
                        ;    REGISTERS NOT AFFECTED
                        ;
                        ;*****************************************************************************
                        ;*****************************************************************************
004136                  $RESET:
004136  012777  000001  176130          MOV     #RESET,@TXCSR   ;RESET THE DPV.
004144  105777  176120                  TSTB    @RXCSR          ;IS THE RECEIVE CSR = 0?
004150  001015                          BNE     10$             ;IF NOT ERROR.
004152  005777  176114                  TST     @RDSR           ;IS THE RECEIVE STATUS AND DATA REG = 0?
004156  001012                          BNE     10$             ;IF NOT, ERROR.
004160  032777  000004  176106          BIT     #4,@TXCSR       ;IS TBE SET?
004166  001406                          BEQ     10$             ;IF NOT, ERROR.
004170  105777  176110                  TSTB    @PCR            ;IS THE PARAMETER CONTROL REG = 0?
004174  001003                          BNE     10$             ;IF NOT, ERROR.
004176  005777  176074                  TST     @TDSR           ;IS THE XMIT STATUS AND DATA REG = 0?
004202  001413                          BEQ     20$             ;IF YES - RESET OK.
004204                  10$:
004204  011637  002416                  MOV     (SP),SUBRPC     ;FLAG WHERE THIS SUBR. WAS CALLED.
004210  162737  000004  002416          SUB     #4,SUBRPC       ;ADJUST THE PC
004216                  ERRDF   1,EMG3,ERRG11   ;PRINT ERROR MESSAGE
004216  104455                                                          TRAP    C$ERDF
004220  000001                                                          .WORD   1
004222  013414                                                          .WORD   EMG3
004224  007452                                                          .WORD   ERRG11
004226  005037  002416                  CLR     SUBRPC          ;CLEAR THE FLAG
004232                  20$:
004232  017737  176032  002444          MOV     @RXCSR,MODEM    ;SAVE THE MODEM STATUS.
004240  042737  006760  002444          BIC     #6760,MODEM     ;CLEAR ALL BUT MODEM
004246  032777  000040  176020          BIT     #TM,@TXCSR      ;IS TEST MODE SET?
004254  001417                          BEQ     30$             ;IF NOT OK
004256  052737  000040  002444          BIS     #TM,MODEM       ;OTHERWISE SET TM IN MODEM
                                                                ;ALSO CHECK FOR -12V
004264  122777  000162  176006          CMPB    #162,@CSR1      ;ARE RING, CTS, CD AND DM ALSO SET?
004272  001010                          BNE     30$             ;IF NOT, PROBABLY HAVE -12V
004274                  PRINTB  #FMG9           ;PROMPT USER TO CHECK -12V.
004274  012746  011402                                                  MOV     #FMG9,-(SP)
004300  012746  000001                                                  MOV     #1,-(SP)
004304  010600                                                          MOV     SP,R0
004306  104414                                                          TRAP    C$PNTB
004310  062706  000004                                                  ADD     #4,SP
```

GLOBAL SUBROUTINES

```
     49 004314                          30$:
     50
     51 004314  000207                          RETURN
     52
```

GLOBAL SUBROUTINES

```
                        ;*****************************************************************************
                        ;*****************************************************************************
                        ;
                        ;                       SUBROUTINE $BUFRS
                        ;
                        ;               FUNCTION -  TO SET UP THE TRANSMIT BUFFER WITH A DATA
                        ;                           PATTERN AND TO CLEAR THE RECEIVE BUFFER
                        ;
                        ;       CALLING FORMAT:         JSR     PC,$BUFRS
                        ;
                        ;
                        ;       ENTRY CONDITIONS - IPCSAR  = IMAGE OF THE PCSAR (CSR 2 OF THE DPV)
                        ;                          IPCR    = IMAGE OF THE PCR (CSR 5 OF THE DPV)
                        ;                          XTYPE   = ADDRESS OF THE XMIT TYPE
                        ;                          XCOUNT  = # OF CHARACTERS TO TRANSMIT
                        ;                          LENGTH  = CHARACTER LENGTH
                        ;                          MODE    = PROTOCOL TYPE (BCP OR BOP)
                        ;
                        ;
                        ;       EXIT CONDITIONS  - ECOUNT  = # OF CHARACTERS TO TRANSMIT (MODIFIED
                        ;                                    XCOUNT)
                        ;                          XMTBUF  = CONTAINS XMIT DATA TYPE PATTERN
                        ;                          RCVBUF  = RECEIVE BUFFER CLEARED
                        ;
                        ;       CALLED BY        - TESTS 15-40
                        ;
                        ;    REGISTERS R1-R4 DESTROYED
                        ;
                        ;*****************************************************************************
                        ;*****************************************************************************
004316                  $BUFRS:
013701  002352                 MOV     LENGTH,R1       ;GET THE CHARACTER LENGTH
013702  002470                 MOV     XTYPE,R2        ;ADDRESS OF DATA TYPE
012703  002673                 MOV     #XMTBUF,R3      ;ADDRESS OF TRANSMIT BUFFER.
013704  002472                 MOV     XCOUNT,R4       ;CHARACTER COUNT.
005737  002362                 TST     MODE            ;WHAT MODE?
001444                         BEQ     10$             ;IF BCP, SKIP ADDRESS CHECK.
                        ;
032737  100000  002344         BIT     #APA,IPCSAR     ;IS APA DESIRED?
001403                         BEQ     5$              ;IF NOT CHECK SECONDARY ADDRESS.
112723  000377                 MOVB    #377,(R3)+      ;PUT APA IN THE XMIT BUFFER
000422                         BR      7$
004362                  5$:
032737  010000  002344         BIT     #SECADR,IPCSAR  ;IS THE SECONDARY ADDRESS DESIRED?
001403                         BEQ     6$              ;IF NOT  - JUST LOAD DATA
113723  002344                 MOVB    IPCSAR,(R3)+    ;PUT SECONDARY ADDRESS IN THE XMIT BUFFER.
000413                         BR      7$
004400                  6$:
112223                         MOVB    (R2)+,(R3)+     ;LOAD ADDRESS CHARACTER
032737  000020  002342         BIT     #EXADD,IPCR     ;IS EXTENDED ADDRESS REQUESTED?
001406                         BEQ     7$              ;BR IF NOT
142763  000001  177777         BICB    #BIT0,-1(R3)    ;MAKE SURE THE LSB OF THE ADDRESS IS 0
112223                         MOVB    (R2)+,(R3)+     ;GET THE EXTENDED ADDRESS BYTE.
005237  002472                 INC     XCOUNT          ;COMPENSATE TRANSMIT COUNT.
004426                  7$:
112223                         MOVB    (R2)+,(R3)+     ;LOAD CONTROL CHARACTER
032737  000010  002342         BIT     #EXCON,IPCR     ;IS EXTENDED CONTROL DESIRED?
```

```
GLOBAL SUBROUTINES
     58 004436  001403                          BEQ     8$              ;BR IF NOT
     59 004440  112223                          MOVB    (R2)+,(R3)+     ;LOAD EXTENDED CONTROL
     60 004442  005237  002472                  INC     XCOUNT          ;COMPENSATE TRANSMIT COUNT
     61 004446                          8$:
     62 004446  062737  000002  002472          ADD     #2,XCOUNT       ;COMPENSATE TRANSMIT COUNT
     63 004454                          10$:
     64 004454  013737  002472  002474          MOV     XCOUNT,ECOUNT   ;TRANSMIT COUNT IS THE END COUNT IN BCP MODE.
     65 004462                          11$:
     66 004462  112213                          MOVB    (R2)+,(R3)      ;SAVE THE DATA IN THE TRANSMIT BUFFER
     67 004464  146123  004514                  BICB    MASK(R1),(R3)+  ;CLEAR UNUSED BITS (DEPENDS ON CHAR LENGTH)
     68 004470  005304                          DEC     R4              ;DECREMENT COUNTER.
     69 004472  001373                          BNE     11$             ;LOOP UNTIL THE TRANSMIT BUFFER IS LOADED.
     70
     71 004474  012701  003273                  MOV     #RCVBUF,R1      ;GET THE ADDRESS OF THE RECEIVE BUFFER
     72 004500  012702  000400                  MOV     #RSIZE,R2       ;GET THE LENGTH OF THE BUFFER.
     73 004504                          20$:
     74 004504  105021                          CLRB    (R1)+           ;CLEAR THE ENTIRE BUFFER
     75 004506  005302                          DEC     R2              ;DECREMENT THE COUNTER
     76 004510  001375                          BNE     20$             ;LOOP UNTIL THE ENTIRE RECEIVE BUFFER IS CLEAR
     77
     78 004512  000207                          RETURN
     79
     80 004514     000     376     374  MASK:  .BYTE   0,376,374,370,360,340,300,200,0
        004517     370     360     340
        004522     300     200     000
     81                                         .EVEN
     82
```

```
                                        ;;*****************************************************************
                                        ;;*****************************************************************
                                        ;
                                        ;                         SUBROUTINE $DATA
                                        ;
                                        ;                 FUNCTION -
                                        ;
                                        ;         CALLING FORMAT:           JSR     PC,$DATA
                                        ;                                   JSR     PC,$DATA1
                                        ;
                                        ;
                                        ;         ENTRY CONDITIONS - RCVBUF  = CLEARED RECEIVE BUFFER
                                        ;                            XMTBUF  = XMIT BUFFER
                                        ;                            MAINT   = MAINTENANCE MODE FLAG
                                        ;                                      IF SET, MAINT. MODE DESIRED
                                        ;                            RXMINI  = RECEIVER INIT WITH MAINTENANCE MODE SET.
                                        ;                            RXINIT  = USER SELECTED RECEIVER INIT WORD.
                                        ;                            TXMINI  = XMIT INIT WORD WITH MAINTENANCE MODE SET.
                                        ;                            TXINIT  = USER SELECTED XMIT INIT WORD
                                        ;                            TIMER   = TIME OUT VALUE (DETERMINED IN INIT -
                                        ;                                      DEPENDENT ON PROCESSOR TYPE)
                                        ;                            EXERR   = FLAG FOR EXPECTED ERROR.
                                        ;                                         0 = NO ERROR EXPECTED.
                                        ;                                      NON0 = ERROR EXPECTED.
                                        ;
                                        ;
                                        ;
                                        ;         EXIT CONDITIONS  - IF A CORRECT DATA TRANSMISSION - CARRY CLEAR
                                        ;                            IF ERROR IN TRANSMISSION - CARRY SET AND ERROR
                                        ;                            FLAG SET. IF ERROR WAS NOT EXPECTED, A MESSAGE
                                        ;                            WILL BE OUTPUT.
                                        ;
                                        ;         CALLED BY        - $DATA  - TESTS 15-28 & 30 - 40
                                        ;                            $DATA1 - TESTS 41 -43
                                        ;
                                        ;
                                        ;     REGISTERS R1-R5 DESTROYED
                                        ;
                                        ;;*****************************************************************
                                        ;;*****************************************************************
004526                                  $DATA:

004526  005037  002376                          CLR     RFLAG           ;CLEAR THE RECEIVE FLAG
004532  005037  002424                          CLR     TFLAG           ;CLEAR THE TRANSMIT FLAG
004536  005037  002360                          CLR     MCFLAG          ;CLEAR THE MODEM CONTROL FLAG
004542  005037  002332                          CLR     ERROR           ;ERROR CONDITION FLAG
004546  005037  002426                          CLR     TIMEO           ;CLEAR TIMEOUT FLAG

004552  012701  003273                          MOV     #RCVBUF,R1      ;RECEIVE BUFFER
004556  012702  002673                          MOV     #XMTBUF,R2      ;TRANSMIT BUFFER
004562  013703  002472                          MOV     XCOUNT,R3       ;TRANSMIT COUNTER
004566  005037  002500                          CLR     RCOUNT          ;CLEAR RECEIVE COUNTER.
                                                                        ;SET UP THE VECTORS.
004572                                          SETVEC  XMTVEC,#XDATA,#PRI04
004572  012746  000200                                                                  MOV     #PRI04,-(SP)
004576  012746  017156                                                                  MOV     #XDATA,-(SP)
004602  013746  002266                                                                  MOV     XMTVEC,-(SP)
```

GLOBAL SUBROUTINES

```
                                                                                                        MOV     #3,-(SP)
004606  012746  000003                                                                                  TRAP    C$SVEC
004612  104437                                                                                          ADD     #10,SP
004614  062706  000010
55 004620                               SETVEC  RCVEC,#RDATA,#PRI04
004620  012746  000200                                                                                  MOV     #PRI04,-(SP)
004624  012746  016544                                                                                  MOV     #RDATA,-(SP)
004630  013746  002264                                                                                  MOV     RCVEC,-(SP)
004634  012746  000003                                                                                  MOV     #3,-(SP)
004640  104437                                                                                          TRAP    C$SVEC
004642  062706  000010                                                                                  ADD     #10,SP
56 004646                               SETPRI  #PRI00          ;ENABLE INTERRUPTS
004646  012700  000000                                                                                  MOV     #PRI00,R0
004652  104441                                                                                          TRAP    C$SPRI
57 004654  005737  002356               TST     MAINT           ;SET MAINTENANCE MODE?
58 004660  001407                       BEQ     $DATA1          ;BR IF NOT
59 004662  053777  002406  175400       BIS     RXMINI,@RXCSR   ;INIT RECEIVER WITH MAINTENANCE MODE
60 004670  053777  002442  175376       BIS     TXMINI,@TXCSR   ;INIT TRANSMITTER WITH MAINT. MODE.
61 004676  000406                       BR      $GO
62
63 004700                       $DATA1:
64 004700  053777  002404  175362       BIS     RXINIT,@RXCSR   ;ISSUE RECEIVER INIT (DETERMINED IN INIT CODE)
65 004706  053777  002440  175360       BIS     TXINIT,@TXCSR   ;ISSUE XMIT INIT (DETERMINED IN INIT CODE)
66 004714                       $GO:
67 004714  011637  002416               MOV     (SP),SUBRPC     ;FLAG WHERE THIS SUBR. WAS CALLED.
68 004720  162737  000004  002416       SUB     #4,SUBRPC       ;ADJUST THE PC
69 004726  013704  002430               MOV     TIMER,R4        ;SET UP TIMER
70 004732                       8$:
71 004732  012705  001000               MOV     #1000,R5        ;INNER LOOP COUNTER
72 004736                       10$:
73 004736  005777  175334               TST     @TDSR           ;IS THERE A TRANSMITTER ERROR?
74 004742  100426                       BMI     20$             ;BR IF YES
75 004744  005737  002376               TST     RFLAG           ;IS THE RECEIVER DONE?
76 004750  001033                       BNE     22$             ;EXIT LOOP IF YES
77 004752  005305                       DEC     R5              ;DECREMENT INNER LOOP COUNTER
78 004754  001370                       BNE     10$             ;LOOP UNTIL DONE
79 004756  022737  000002  002310       CMP     #2,TURN         ;IS THIS RS422?
80 004764  001401                       BEQ     11$             ;IF YES - DON'T ALLOW A SUPERVISOR BREAK.
81 004766                               BREAK                   ;BREAK FOR SUPERVISOR INTERRUPT
004766  104422                                                                                          TRAP    C$BRK
82 004770                       11$:
83 004770  005304                       DEC     R4              ;DECREMENT OUTSIDE LOOP COUNTER
84 004772  001357                       BNE     8$              ;LOOP UNTIL DONE
85 004774  005237  002426               INC     TIMEO           ;SET TIME OUT FLAG.
86
87 005000  005737  002334               TST     EXERR           ;WAS AN ERROR EXPECTED?
88 005004  001036                       BNE     25$             ;IF YES - EXIT WITHOUT ERROR MESSAGE.
89 005006                               ERRDF   2,EMG2,ERRG2    ;TIME OUT
005006  104455                                                                                          TRAP    C$ERDF
005010  000002                                                                                          .WORD   2
005012  013347                                                                                          .WORD   EMG2
005014  006560                                                                                          .WORD   ERRG2
90 005016  000422                       BR      24$
91 005020                       20$:
92 005020  042777  000020  175246       BIC     #TXENA,@TXCSR   ;DISABLE THE TRANSMITTER.
93 005026                               ERRDF   3,EMG30,ERRG2   ;TRANSMIT UNDERRUN
005026  104455                                                                                          TRAP    C$ERDF
005030  000003                                                                                          .WORD   3
```

```
GLOBAL SUBROUTINES
        005032  014642                                                                  .WORD   EMG30
        005034  006560                                                                  .WORD   ERRG2
     94 005036  000412                          BR      24$
     95 005040                          22$:
     96 005040  005737  002376                  TST     RFLAG           ;WAS THIS THE END OF MESSAGE?
     97 005044  100016                          BPL     25$             ;OK - IF YES
     98 005046  005737  002334                  TST     EXERR           ;WAS AN ERROR EXPECTED?
     99 005052  001013                          BNE     25$             ;IF YES - EXIT WITHOUT ERROR MESSAGE.
    100 005054                                  ERRDF   4,EMG31,ERRG2   ;RECEIVER ERROR
        005054  104455                                                                  TRAP    C$ERDF
        005056  000004                                                                  .WORD   4
        005060  014660                                                                  .WORD   EMG31
        005062  006560                                                                  .WORD   ERRG2
    101 005064                          24$:
    102 005064  012737  000001  002332          MOV     #1,ERROR        ;FLAG ERROR
    103 005072  005037  002416                  CLR     SUBRPC          ;CLEAR THE SUBR PC FLAG
    104 005076  000261                          SEC                     ;SET CARRY - ERROR
    105 005100  000403                          BR      30$
    106
    107 005102                          25$:
    108 005102  000241                          CLC                     ;CLEAR CARRY - NO FRROR
    109 005104  005037  002416                  CLR     SUBRPC          ;CLEAR THE SUBR PC FLAG
    110 005110                          30$:
    111 005110  052777  000001  175156          BIS     #RESET,@TXCSR   ;RESET THE DPV
    112 005116                                  CLRVEC  XMTVEC          ;RESTORE VECTORS
        005116  013700  002266                                                          MOV     XMTVEC,R0
        005122  104436                                                                  TRAP    C$CVEC
    113 005124                                  CLRVEC  RCVEC           ;
        005124  013700  002264                                                          MOV     RCVEC,R0
        005130  104436                                                                  TRAP    C$CVEC
    114 005132  000207                          RETURN
    115
```

GLOBAL SUBROUTINES

```
                        ;*****************************************************************************
                        ;*****************************************************************************
                        ;
                        ;                       SUBROUTINE  $CHECK
                        ;
                        ;               FUNCTION - AFTER A DATA TRANSMISSION CHECK
                        ;                          1. THE ERROR CHECK BIT 2. THAT THE XMIT AND RCV
                        ;                          CHARACTER COUNTS ARE EQUAL 3. THAT THE XMIT AND
                        ;                          RCV BUFFERS ARE IDENTICAL
                        ;
                        ;       CALLING FORMAT:          JSR     PC,$CHECK
                        ;                                JSR     PC,$CHK1
                        ;
                        ;
                        ;       ENTRY CONDITIONS - IRDSR  = IMAGE OF THE LAST RECEIVED RDSR
                        ;                          XCOUNT = TRANSMIT CHARACTER COUNT.
                        ;                          RCOUNT = RECEIVER CHARACTER COUNT.
                        ;                          XMTBUF = THE TRANSMIT BUFFER STARTING ADDRESS.
                        ;                          RCVBUF = THE RECEIVE BUFFER STARTING ADDRESS.
                        ;                          MODE   = PROTOCOL MODE: 0 = BCP,  NONO = BOP
                        ;
                        ;
                        ;       EXIT CONDITIONS  - IF ERROR DETECTED, A MESSAGE WILL BE OUTPUT.
                        ;
                        ;       CALLED BY        - $CHECK - TESTS 15, 17-23, 29-40
                        ;                          $CHK1  - TESTS 41-43
                        ;
                        ;    REGISTERS R1 - R3 DESTROYED
                        ;
                        ;*****************************************************************************
                        ;*****************************************************************************
005134                  $CHECK:
                                .ENABL  LSB             ;ENABLE LOCAL SYMBOL BLOCK.
005134  005737  002362          TST     MODE            ;IS THIS BCP MODE?
005140  001404                  BEQ     1$              ;BR IF YES
005142  005737  002350          TST     IRDSR           ;IS THE ERROR BIT SET (BIT 15)
005146  100410                  BMI     3$              ;IF YES - CRC ERROR.
005150  000421                  BR      4$
005152                  1$:
005152  032737  002000  002344  BIT     #BIT10,IPCSAR   ;WAS CRC16 USED? (ONLY TIME BIT 10 IS SET)
005160  001015                  BNE     4$              ;IF NOT DON'T CHECK BIT.
005162  005737  002350          TST     IRDSR           ;IS THE ERROR BIT SET (BIT 15)?
005166  100412                  BMI     4$              ;IF YES - OK
005170                  3$:
005170  011637  002416          MOV     (SP),SUBRPC     ;FLAG WHERE THIS SUBR. WAS CALLED.
005174  162737  000004  002416  SUB     #4,SUBRPC       ;ADJUST THE PC
005202                          ERRDF   5,EMG37,ERRG1   ;CRC ERROR
005202  104455                                                  TRAP    C$ERDF
005204  000005                                                  .WORD   5
005206  015102                                                  .WORD   EMG37
005210  006532                                                  .WORD   ERRG1
005212  000444                  BR      30$
005214                  4$:
005214  023737  002472  002500  CMP     XCOUNT,RCOUNT   ;ARE THE CHARACTER COUNTS THE SAME.
005222  001412                  BEQ     5$              ;IF YES - CONTINUE
005224  011637  002416          MOV     (SP),SUBRPC     ;FLAG WHERE THIS SUBR. WAS CALLED.
```

GLOBAL SUBROUTINES

```
     54 005230  162737  000004  002416          SUB     #4,SUBRPC       ;ADJUST THE PC
     55 005236                                  ERRDF   6,EMG25,ERRG14  ;CHARACTER COUNTS DIFFERENT
        005236  104455                                                          TRAP    C$ERDF
        005240  000006                                                          .WORD   6
        005242  014601                                                          .WORD   EMG25
        005244  010640                                                          .WORD   ERRG14
     56 005246  000426                          BR      30$
     57 005250                          5$:
     58 005250  012701  002673                  MOV     #XMTBUF,R1      ;GET THE ADDRESS OF THE XMIT BUFFER.
     59 005254  012702  003273                  MOV     #RCVBUF,R2      ;GET THE ADDRESS OF THE RECV BUFFER.
     60 005260  013703  002472                  MOV     XCOUNT,R3       ;GET THE CHARACTER COUNT
     61 005264                          $CHK1:
     62 005264  122122                          CMPB    (R1)+,(R2)+     ;ARE THE CHARACTERS THE SAME
     63 005266  001003                          BNE     20$             ;IF NOT, REPORT THE ERROR
     64 005270  005303                          DEC     R3              ;DECREMENT THE COUNT.
     65 005272  001414                          BEQ     30$             ;LOOP UNTIL DONE
     66 005274  000773                          BR      $CHK1
     67 005276                          20$:
     68 005276  011637  002416                  MOV     (SP),SUBRPC     ;FLAG WHERE THIS SUBR. WAS CALLED.
     69 005302  162737  000004  002416          SUB     #4,SUBRPC       ;ADJUST THE PC
     70 005310  005301                          DEC     R1              ;POINT TO DATA IN ERROR
     71 005312  005302                          DEC     R2              ;POINT TO DATA IN ERROR.
     72 005314                                  ERRDF   7,EMG26,ERRG3   ;CHARACTERS DON'T MATCH
        005314  104455                                                          TRAP    C$ERDF
        005316  000007                                                          .WORD   7
        005320  014627                                                          .WORD   EMG26
        005322  006674                                                          .WORD   ERRG3
     73 005324                          30$:
     74 005324  005037  002416                  CLR     SUBRPC          ;CLEAR THE SUBR PC FLAG
     75                                         .DSABL  LSB             ;DISABLE LOCAL SYMBOL BLOCK.
     76 005330  000207                          RETURN
     77
```

```
GLOBAL SUBROUTINES
                        ;*****************************************************************************
                        ;*****************************************************************************
                        ;
                        ;                       SUBROUTINE $MODEM
                        ;
                        ;               FUNCTION - TO PRINT OUT THE MODEM STATUS FROM A TEST
                        ;
                        ;       CALLING FORMAT:         JSR     PC,$MODEM
                        ;
                        ;
                        ;       ENTRY CONDITIONS - ERROR  = FLAG SET IF THERE WAS AN ERROR IN $DATA
                        ;                          MCFLAG = # OF MODEM CONTROL INTERRUPTS RECEIVED.
                        ;                                   ALSO USED AS THE INDEX INTO THE MODEM
                        ;                                   STATUS TABLE.
                        ;                          MODEM  = ADDRESS OF MODEM STATUS TABLE
                        ;
                        ;
                        ;       EXIT CONDITIONS  - IF THERE IS AN ERROR OR MORE THAT 1 MODEM
                        ;                          CONTROL INTERRUPT, PRINT OUT MODED STATUS.
                        ;                          OTHERWISE, UNEVENTFUL EXIT.
                        ;
                        ;       CALLED BY        - TESTS 30-40
                        ;
                        ;    REGISTERS R1-R3 DESTROYED
                        ;
                        ;*****************************************************************************
                        ;*****************************************************************************
005332                  $MODEM:
005332  011637  002416          MOV     (SP),SUBRPC     ;FLAG WHERE THIS SUBR. WAS CALLED.
005336  162737  000004  002416  SUB     #4,SUBRPC       ;ADJUST THE PC
005344  005737  002332          TST     ERROR           ;WAS THERE AN ERROR IN THE $DATA ROUTINE
005350  001041                  BNE     1$              ;IF YES PRINT OUT STATUS
005352  022737  000001  002360  CMP     #1,MCFLAG       ;WAS THERE MORE THAN 1 MODEM CONTROL INT?
005360  002152                  BGE     35$             ;IF NOT - SKIP PRINT OUT
005362                          ERRDF   8,EMG40,ERRG1   ;MULTIPLE INTERRUPTS RECEIVED
005362  104455                                                  TRAP    C$ERDF
005364  000010                                                  .WORD   8
005366  015175                                                  .WORD   EMG40
005370  006532                                                  .WORD   ERRG1
005372                          PRINTB  #FMODEM,MCFLAG  ;PRINT THE NUMBER OF INTERRUPTS.
005372  013746  002360                                          MOV     MCFLAG,-(SP)
005376  012746  005710                                          MOV     #FMODEM,-(SP)
005402  012746  000002                                          MOV     #2,-(SP)
005406  010600                                                  MOV     SP,R0
005410  104414                                                  TRAP    C$PNTB
005412  062706  000006                                          ADD     #6,SP
005416  022737  000011  002360  CMP     #9.,MCFLAG      ;WERE MORE THAN NINE INTERRUPTS RECEIVED?
005424  002013                  BGE     1$              ;IF NOT, SKIP THE NEXT MESSAGE.
005426  012737  000011  002360  MOV     #9.,MCFLAG      ;ONLY PRINT OUT 9 INTERRUPTS
005434                          PRINTB  #FMODE6         ;INFORM THE USER INTERRUPTS DISABLED.
005434  012746  006205                                          MOV     #FMODE6,-(SP)
005440  012746  000001                                          MOV     #1,-(SP)
005444  010600                                                  MOV     SP,R0
005446  104414                                                  TRAP    C$PNTB
005450  062706  000004                                          ADD     #4,SP
005454                  1$:
```

```
GLOBAL SUBROUTINES
     43 005454  012701  002444                MOV     #MODEM,R1       ;ADDRESS OF MODEM STATUS
     44 005460                                 PRINTB  #FMODE0
        005460  012746  005775                                                  MOV     #FMODE0,-(SP)
        005464  012746  000001                                                  MOV     #1,-(SP)
        005470  010600                                                          MOV     SP,R0
        005472  104414                                                          TRAP    C$PNTB
        005474  062706  000004                                                  ADD     #4,SP
     45 005500                                 PRINTB  #FMODE1         ;PRINT INITIAL MODEM STATUS
        005500  012746  006024                                                  MOV     #FMODE1,-(SP)
        005504  012746  000001                                                  MOV     #1,-(SP)
        005510  010600                                                          MOV     SP,R0
        005512  104414                                                          TRAP    C$PNTB
        005514  062706  000004                                                  ADD     #4,SP
     46 005520                                 PRINTB  #FMODE2
        005520  012746  006113                                                  MOV     #FMODE2,-(SP)
        005524  012746  000001                                                  MOV     #1,-(SP)
        005530  010600                                                          MOV     SP,R0
        005532  104414                                                          TRAP    C$PNTB
        005534  062706  000004                                                  ADD     #4,SP
     47 005540  005002                         CLR     R2              ;CLEAR COUNTER
     48 005542                          5$:
     49 005542  012703  006300                 MOV     #MMASK,R3
     50 005546  012704  000012                 MOV     #10.,R4         ;# OF BITS TO CHECK IN THE MODEM STATUS
     51
     52 005552                          10$:
     53 005552  032311                         BIT     (R3)+,(R1)      ;CHECK THE BIT
     54 005554  001011                         BNE     12$             ;IS IT SET?
     55 005556                                 PRINTB  #FMODE3         ;IF NOT, PRINT A 0
        005556  012746  006137                                                  MOV     #FMODE3,-(SP)
        005562  012746  000001                                                  MOV     #1,-(SP)
        005566  010600                                                          MOV     SP,R0
        005570  104414                                                          TRAP    C$PNTB
        005572  062706  000004                                                  ADD     #4,SP
     56 005576  000410                         BR      15$
     57 005600                          12$:
     58 005600                                 PRINTB  #FMODE4         ;PRINT A 1
        005600  012746  006146                                                  MOV     #FMODE4,-(SP)
        005604  012746  000001                                                  MOV     #1,-(SP)
        005610  010600                                                          MOV     SP,R0
        005612  104414                                                          TRAP    C$PNTB
        005614  062706  000004                                                  ADD     #4,SP
     59 005620                          15$:
     60 005620  005304                         DEC     R4              ;DECREMENT BIT COUNTER
     61 005622  001353                         BNE     10$             ;LOOP UNTIL DONE.
     62
     63
     64 005624  005737  002360                 TST     MCFLAG          ;IS THIS THE LAST STATUS
     65 005630  001416                         BEQ     30$             ;IF YES, EXIT
     66 005632  005721                         TST     (R1)+           ;INCREMENT MODEM STATUS POINTER.
     67 005634  005337  002360                 DEC     MCFLAG          ;DECREMENT MC FLAG
     68 005640  005202                         INC     R2              ;INCREMENT COUNTER.
     69
     70 005642                                 PRINTB  #FMODE5,R2      ;PRINT NEXT MODEM
        005642  010246                                                          MOV     R2,-(SP)
        005644  012746  006155                                                  MOV     #FMODE5,-(SP)
        005650  012746  000002                                                  MOV     #2,-(SP)
        005654  010600                                                          MOV     SP,R0
```

```
GLOBAL SUBROUTINES
        005656  104414                                                          TRAP    C$PNTB
        005660  062706  000006                                                  ADD     #6,SP
     71 005664  000726                  BR      5$
     72 005666                  30$:
     73 005666                          PRINTB  #FMG6           ;PRINT CARRIAGE RETURN.
        005666  012746  011270                                                  MOV     #FMG6,-(SP)
        005672  012746  000001                                                  MOV     #1,-(SP)
        005676  010600                                                          MOV     SP,R0
        005700  104414                                                          TRAP    C$PNTB
        005702  062706  000004                                                  ADD     #4,SP
     74 005706                  35$:
     75 005706  000207                  RETURN
     76
     77 005710     045     101     116  FMODEM: .ASCIZ  /%ANUMBER OF MODEM CONTROL INTERRUPTS RECEIVED: %D2%N/
        005713     125     115     102
        005716     105     122     040
        005721     117     106     040
        005724     115     117     104
        005727     105     115     040
        005732     103     117     116
        005735     124     122     117
        005740     114     040     111
        005743     116     124     105
        005746     122     122     125
        005751     120     124     123
        005754     040     122     105
        005757     103     105     111
        005762     126     105     104
        005765     072     040     045
        005770     104     062     045
        005773     116     000
     78 005775     045     116     045  FMODE0: .ASCIZ  /%N%AMODEM STATUS%N%S14/
        006000     101     115     117
        006003     104     105     115
        006006     040     123     124
        006011     101     124     125
        006014     123     045     116
        006017     045     123     061
        006022     064     000
     79 006024     045     101     040  FMODE1: .ASCIZ  /%A     RL  DTR  RTS   LL   TM  DSR   CD  CTS  RING CNG/
        006027     040     040     040
        006032     040     122     114
        006035     040     040     104
        006040     124     122     040
        006043     040     122     124
        006046     123     040     040
        006051     040     114     114
        006054     040     040     040
        006057     124     115     040
        006062     040     104     123
        006065     122     040     040
        006070     040     103     104
        006073     040     040     103
        006076     124     123     040
        006101     040     122     111
        006104     116     107     040
        006107     103     116     107
```

```
GLOBAL SUBROUTINES
            006112  000
     80     006113  045     116     045     FMODE2: .ASCIZ  /%N%AMODEM ON RESET:/
            006116  101     115     117
            006121  104     105     115
            006124  040     117     116
            006127  040     122     105
            006132  123     105     124
            006135  072     000
     81     006137  045     123     064     FMODE3: .ASCIZ  /%S4%A0/
            006142  045     101     060
            006145  000
     82     006146  045     123     064     FMODE4: .ASCIZ  /%S4%A1/
            006151  045     101     061
            006154  000
     83     006155  045     116     045     FMODE5: .ASCIZ  /%N%AMODEM CHANGE %D1%A:/
            006160  101     115     117
            006163  104     105     115
            006166  040     103     110
            006171  101     116     107
            006174  105     040     045
            006177  104     061     045
            006202  101     072     000
     84     006205  045     101     052     FMODE6: .ASCIZ  /%A** MODEM CONTROL INTERRUPT DISABLED AFTER 9 CHANGES **%N/
            006210  052     040     115
            006213  117     104     105
            006216  115     040     103
            006221  117     116     124
            006224  122     117     114
            006227  040     111     116
            006232  124     105     122
            006235  122     125     120
            006240  124     040     104
            006243  111     123     101
            006246  102     114     105
            006251  104     040     101
            006254  106     124     105
            006257  122     040     071
            006262  040     103     110
            006265  101     116     107
            006270  105     123     040
            006273  052     052     045
            006276  116     000
     85                                     .EVEN
     86                                             ;MASKS OF EACH BIT
     87     006300  000001  000002  000004  MMASK:  .WORD   SF,DTR,RTS,LL,TM,DM,RR,CTS,IC,DSCNG
            006306  000010  000040  001000
            006314  010000  020000  040000
            006322  100000
     88
     89
     90
```

```
GLOBAL SUBROUTINES
                        ;*****************************************************************************
                        ;*****************************************************************************
                        ;
                        ;                       SUBROUTINE $TURN
                        ;
                        ;               FUNCTION - DETERMINE IF TURNAROUND IS AVAILABLE
                        ;
                        ;       CALLING FORMAT:         JSR     PC,$TURN
                        ;
                        ;       ENTRY CONDITIONS -      TURN - 0 = TURNAROUND OFF
                        ;                               STARES   = START RESTART COUNT
                        ;
                        ;
                        ;       EXIT CONDITIONS  -      TURNAROUND ON  - CARRY CLEAR (DO THE TEST)
                        ;                               TURNAROUND OFF - CARRY SET (DON'T DO THE TEST)
                        ;                               IF TURNAROUND OFF AND IF ON FIRST PASS, OUTPUT
                        ;                               A MESSAGE TO THE  USER.
                        ;
                        ;       CALLED BY       - TESTS 12 - 14
                        ;
                        ;    REGISTERS NOT EFFECTED
                        ;
                        ;*****************************************************************************
                        ;*****************************************************************************
006324                  $TURN:
006324  005737  002310          TST     TURN            ;IS THERE A TURNAROUND
006330  001022                  BNE     5$              ;IF YES - CLEAR CARRY TO DO THE TEST.
006332  022737  000001  002320  CMP     #1,STARES       ;IS THIS THE FIRST PASS
006340  001014                  BNE     1$              ;IF NOT, DON'T OUTPUT MESSAGE JUST SET FLAG.
006342                          PRINTX  #FMG0,L$TEST,LOGDEV ;INFORM THE USER THAT TEST CAN'T BE RUN
006342  013746  002354                                                  MOV     LOGDEV,-(SP)
006346  013746  002114                                                  MOV     L$TEST,-(SP)
006352  012746  010750                                                  MOV     #FMG0,-(SP)
006356  012746  000003                                                  MOV     #3,-(SP)
006362  010600                                                          MOV     SP,R0
006364  104415                                                          TRAP    C$PNTX
006366  062706  000010                                                  ADD     #10,SP
                                                    ;WITHOUT THE TURNAROUND.
006372                  1$:
006372  000261                  SEC                     ;FLAG NOT TO DO THE TEST.
006374  000401                  BR      10$             ;BR TO RETURN
006376                  5$:
006376  000241                  CLC                     ;FLAG TO DO THE TEST.
006400                  10$:
006400  000207                  RETURN
```

GLOBAL SUBROUTINES

```
                        ;*****************************************************************************
                        ;*****************************************************************************
                        ;
                        ;                       SUBROUTINE $SPEED
                        ;
                        ;             FUNCTION - DETERMINE IF THE TEST CAN BE RUN WITH
                        ;                        WITH THE SELECTED TURNAROUND AND/OR PROCESSOR.
                        ;
                        ;       CALLING FORMAT:         JSR     PC,$SPEED
                        ;
                        ;       ENTRY CONDITIONS -      TURN = 1 - RS423
                        ;                               TURN = 2 - RS422
                        ;                               CPU  = 0 - LSI 11
                        ;                               CPU  = 1 - LSI 11/2
                        ;                               CPU  = 2 - LSI 11/23
                        ;
                        ;
                        ;       EXIT CONDITIONS  -      OK TO RUN TEST - CARRY CLEAR
                        ;                               DON'T RUN TEST - CARRY SET
                        ;                               IF TEST CAN'T BE RUN, THE USER WILL BE
                        ;                               INFORMED ON THE FIRST PASS.
                        ;
                        ;       CALLED BY       - $SPEED CALLED BY TESTS 29 - 41
                        ;
                        ;    REGISTERS NOT EFFECTED
                        ;
                        ;*****************************************************************************
                        ;*****************************************************************************
006402                  $SPEED:
006402  005737  002312          TST     CPU             ;IS THIS A LSI 11/23?
006406  001024                  BNE     5$              ;IF YES - CLEAR CARRY TO DO THE TEST.
006410  022737  000002  002310  CMP     #2,TURN         ;IS THIS RS422?
006416  001020                  BNE     5$              ;IF NOT - CLEAR CARRY AND DO THE TEST.
006420  022737  000001  002320  CMP     #1,STARES       ;IS THIS THE FIRST PASS?
006426  001012                  BNE     1$              ;IF NOT, DON'T OUTPUT MESSAGE JUST SET FLAG.
006430                          PRINTX  #FMG27,L$TEST   ;INFORM THE USER THAT THE TEST CAN'T BE RUN
006430  013746  002114                                                          MOV     L$TEST,-(SP)
006434  012746  012671                                                          MOV     #FMG27,-(SP)
006440  012746  000002                                                          MOV     #2,-(SP)
006444  010600                                                                  MOV     SP,R0
006446  104415                                                                  TRAP    C$PNTX
006450  062706  000006                                                          ADD     #6,SP
                                                        ;WITH THIS CPU AND RS422.
006454                  1$:
006454  000261                  SEC                     ;FLAG NOT TO DO THE TEST.
006456  000401                  BR      10$             ;BR TO RETURN.
006460                  5$:
006460  000241                  CLC                     ;FLAG TO DO THE TEST.
006462                  10$:
006462  000207                  RETURN
```

GLOBAL SUBROUTINES

```
                        ;*****************************************************************************
                        ;*****************************************************************************
                        ;
                        ;                       SUBROUTINE $DLAY
                        ;
                        ;               FUNCTION - TO SAVE PROGRAM SPACE BY USING ONLY 1
                        ;                          EXPANSION OF THE SUPERVISOR MACRO 'DELAY'
                        ;
                        ;       CALLING FORMAT:         JSR     PC,$DLAY
                        ;                               .WORD   #
                        ;
                        ;       ENTRY CONDITIONS -      @(SP) = # OF DELAY LOOPS TO USE.
                        ;
                        ;
                        ;       EXIT CONDITIONS  -
                        ;
                        ;       CALLED BY       - TESTS  2, 5-9, 12, 13
                        ;
                        ;    REGISTER R0 RESTORED
                        ;
                        ;*****************************************************************************
                        ;*****************************************************************************
006464                  $DLAY:
006464  017600  000000          MOV     @(SP),R0        ;GET THE # OF DELAY LOOPS
006470  062716  000002          ADD     #2,(SP)         ;UPDATE THE PC
006474                  10$:
                        DELAY   1               ;1 DELAY LOOP
006474  012727  000001                                          MOV     #1,(PC)+
006500  000000                                                  .WORD   0
006502  013727  002116                                          MOV     L$DLY,(PC)+
006506  000000                                                  .WORD   0
006510  005367  177772                                          DEC     -6(PC)
006514  001375                                                  BNE     .-4
006516  005367  177756                                          DEC     -22(PC)
006522  001367                                                  BNE     .-20
006524  005300          DEC     R0              ;DECREMENT VARIABLE LOOP COUNTER
006526  001362          BNE     10$             ;LOOP UNTIL DONE
006530  000207          RETURN
```

GLOBAL SUBROUTINES
1

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

006532                  BGNMSG  ERRG1
006532                                                                  ERRG1::
006532                          PRINTB  #FMG3,SUBRPC    ;PC THAT SUBROUTINE WAS CALLED.
006532  013746  002416                                                          MOV     SUBRPC,-(SP)
006536  012746  011140                                                          MOV     #FMG3,-(SP)
006542  012746  000002                                                          MOV     #2,-(SP)
006546  010600                                                                  MOV     SP,R0
006550  104414                                                                  TRAP    C$PNTB
006552  062706  000006                                                          ADD     #6,SP
006556                  ENDMSG
006556                                                                  L10001:
006556  104423                                                                  TRAP    C$MSG

006560                  BGNMSG  ERRG2
006560                                                                  ERRG2::
006560  005737  002416          TST     SUBRPC          ;IS THE ERROR IN A SUBROUTINE?
006564  001412                  BEQ     10$             ;IF NOT, DON'T PRINT SUBR. PC
006566                          PRINTB  #FMG3,SUBRPC    ;PC THAT SUBROUTINE WAS CALLED.
006566  013746  002416                                                          MOV     SUBRPC,-(SP)
006572  012746  011140                                                          MOV     #FMG3,-(SP)
006576  012746  000002                                                          MOV     #2,-(SP)
006602  010600                                                                  MOV     SP,R0
006604  104414                                                                  TRAP    C$PNTB
006606  062706  000006                                                          ADD     #6,SP
006612                  10$:
006612                          PRINTB  #FMG1,@CSR0,@CSR2 ;PRINT CSR0 AND CSR2 CONTENTS.
006612  017746  173454                                                          MOV     @CSR2,-(SP)
006616  017746  173446                                                          MOV     @CSR0,-(SP)
006622  012746  011046                                                          MOV     #FMG1,-(SP)
006626  012746  000003                                                          MOV     #3,-(SP)
006632  010600                                                                  MOV     SP,R0
006634  104414                                                                  TRAP    C$PNTB
006636  062706  000010                                                          ADD     #10,SP
006642                          PRINTB  #FMG2,@CSR4,@CSR6 ;PRINT CSR4 AND CSR2 CONTENTS.
006642  017746  173430                                                          MOV     @CSR6,-(SP)
006646  017746  173422                                                          MOV     @CSR4,-(SP)
006652  012746  011103                                                          MOV     #FMG2,-(SP)
006656  012746  000003                                                          MOV     #3,-(SP)
006662  010600                                                                  MOV     SP,R0
006664  104414                                                                  TRAP    C$PNTB
006666  062706  000010                                                          ADD     #10,SP
006672                  ENDMSG
006672                                                                  L10002:
006672  104423                                                                  TRAP    C$MSG

006674                  BGNMSG  ERRG3
006674                                                                  ERRG3::
006674                          PRINTB  #FMG3,SUBRPC    ;PC THAT SUBROUTINE WAS CALLED.
006674  013746  002416                                                          MOV     SUBRPC,-(SP)
```

GLOBAL ERROR REPORT REPORT SECTION

```
        006700  012746  011140                                                          MOV     #FMG3,-(SP)
        006704  012746  000002                                                          MOV     #2,-(SP)
        006710  010600                                                                  MOV     SP,R0
        006712  104414                                                                  TRAP    C$PNTB
        006714  062706  000006                                                          ADD     #6,SP
    24  006720                          PRINTB  #FMG8,<B,@R1>,<B,@R2>
        006720  005046                                                                  CLR     -(SP)
        006722  151216                                                                  BISB    @R2,(SP)
        006724  005046                                                                  CLR     -(SP)
        006726  151116                                                                  BISB    @R1,(SP)
        006730  012746  011337                                                          MOV     #FMG8,-(SP)
        006734  012746  000003                                                          MOV     #3,-(SP)
        006740  010600                                                                  MOV     SP,R0
        006742  104414                                                                  TRAP    C$PNTB
        006744  062706  000010                                                          ADD     #10,SP
    25  006750                      ENDMSG
        006750                                                                  L10003:
        006750  104423                                                                 TRAP    C$MSG
    26
    27
    28  006752                      BGNMSG  ERRG4
        006752                                                                  ERRG4::
    29  006752                          PRINTB  #FMG4                   ;PRINT HEADER
        006752  012746  011212                                                          MOV     #FMG4,-(SP)
        006756  012746  000001                                                          MOV     #1,-(SP)
        006762  010600                                                                  MOV     SP,R0
        006764  104414                                                                  TRAP    C$PNTB
        006766  062706  000004                                                          ADD     #4,SP
    30  006772                          PRINTB  #FMG7,CSR0,<B,@CSR0>    ;PRINT THE LOW BYTE OF CSR0
        006772  005046                                                                  CLR     -(SP)
        006774  157716  173270                                                         BISB    @CSR0,(SP)
        007000  013746  002270                                                          MOV     CSR0,-(SP)
        007004  012746  011273                                                          MOV     #FMG7,-(SP)
        007010  012746  000003                                                          MOV     #3,-(SP)
        007014  010600                                                                  MOV     SP,R0
        007016  104414                                                                  TRAP    C$PNTB
        007020  062706  000010                                                          ADD     #10,SP
    31  007024                          PRINTB  #FMG5,<B,R1>            ;PRINT EXPECTED CONTENTS
        007024  005046                                                                  CLR     -(SP)
        007026  150116                                                                  BISB    R1,(SP)
        007030  012746  011257                                                          MOV     #FMG5,-(SP)
        007034  012746  000002                                                          MOV     #2,-(SP)
        007040  010600                                                                  MOV     SP,R0
        007042  104414                                                                  TRAP    C$PNTB
        007044  062706  000006                                                          ADD     #6,SP
    32  007050                      ENDMSG
        007050                                                                  L10004:
        007050  104423                                                                 TRAP    C$MSG
    33
    34
    35  007052                      BGNMSG  ERRG7
        007052                                                                  ERRG7::
    36  007052                          PRINTB  #FMG4                   ;PRINT HEADER
        007052  012746  011212                                                          MOV     #FMG4,-(SP)
        007056  012746  000001                                                          MOV     #1,-(SP)
        007062  010600                                                                  MOV     SP,R0
        007064  104414                                                                  TRAP    C$PNTB
```

```
                007066  062706  000004                                                          ADD     #4,SP
     37         007072                          PRINTB  #FMG10,CSR4,<B,@CSR4>   ;PRINT THE LOW BYTE OF CSR4
                007072  005046                                                                  CLR     -(SP)
                007074  157716  173174                                                        BISB    @CSR4,(SP)
                007100  013746  002274                                                        MOV     CSR4,-(SP)
                007104  012746  011454                                                        MOV     #FMG10,-(SP)
                007110  012746  000003                                                        MOV     #3,-(SP)
                007114  010600                                                              MOV     SP,R0
                007116  104414                                                              TRAP    C$PNTB
                007120  062706  000010                                                        ADD     #10,SP
     38         007124                          PRINTB  #FMG5,<B,R1>            ;PRINT EXPECTED CONTENTS
                007124  005046                                                                  CLR     -(SP)
                007126  150116                                                                BISB    R1,(SP)
                007130  012746  011257                                                        MOV     #FMG5,-(SP)
                007134  012746  000002                                                        MOV     #2,-(SP)
                007140  010600                                                              MOV     SP,R0
                007142  104414                                                              TRAP    C$PNTB
                007144  062706  000006                                                        ADD     #6,SP
     39         007150                  ENDMSG
                007150                                                                  L10005:
                007150  104423                                                              TRAP    C$MSG
     40
     41         007152                  BGNMSG  ERRG8
                007152                                                                  ERRG8::
     42         007152                          PRINTB  #FMG4                   ;PRINT HEADER
                007152  012746  011212                                                        MOV     #FMG4,-(SP)
                007156  012746  000001                                                        MOV     #1,-(SP)
                007162  010600                                                              MOV     SP,R0
                007164  104414                                                              TRAP    C$PNTB
                007166  062706  000004                                                        ADD     #4,SP
     43         007172                          PRINTB  #FMG11,CSR5,<B,@PCR>    ;PRINT THE HIGH BYTE OF CSR4
                007172  005046                                                                  CLR     -(SP)
                007174  157716  173104                                                        BISB    @PCR,(SP)
                007200  013746  002304                                                        MOV     CSR5,-(SP)
                007204  012746  011520                                                        MOV     #FMG11,-(SP)
                007210  012746  000003                                                        MOV     #3,-(SP)
                007214  010600                                                              MOV     SP,R0
                007216  104414                                                              TRAP    C$PNTB
                007220  062706  000010                                                        ADD     #10,SP
     44         007224                          PRINTB  #FMG5,<B,R1>            ;PRINT EXPECTED CONTENTS
                007224  005046                                                                  CLR     -(SP)
                007226  150116                                                                BISB    R1,(SP)
                007230  012746  011257                                                        MOV     #FMG5,-(SP)
                007234  012746  000002                                                        MOV     #2,-(SP)
                007240  010600                                                              MOV     SP,R0
                007242  104414                                                              TRAP    C$PNTB
                007244  062706  000006                                                        ADD     #6,SP
     45         007250                  ENDMSG
                007250                                                                  L10006:
                007250  104423                                                              TRAP    C$MSG
     46
     47         007252                  BGNMSG  ERRG9
                007252                                                                  ERRG9::
     48         007252                          PRINTB  #FMG4                   ;PRINT HEADER
                007252  012746  011212                                                        MOV     #FMG4,-(SP)
                007256  012746  000001                                                        MOV     #1,-(SP)
                007262  010600                                                              MOV     SP,R0
```

```
GLOBAL ERROR REPORT REPORT SECTION
        007264  104414                                                          TRAP    C$PNTB
        007266  062706  000004                                                  ADD     #4,SP
     49 007272                          PRINTB  #FMG12,CSR6,<B,@CSR6>   ;PRINT THE LOW BYTE OF CSR6
        007272  005046                                                          CLR     -(SP)
        007274  157716  172776                                                BISB    @CSR6,(SP)
        007300  013746  002276                                                  MOV     CSR6,-(SP)
        007304  012746  011564                                                  MOV     #FMG12,-(SP)
        007310  012746  000003                                                  MOV     #3,-(SP)
        007314  010600                                                          MOV     SP,R0
        007316  104414                                                          TRAP    C$PNTB
        007320  062706  000010                                                  ADD     #10,SP
     50 007324                          PRINTB  #FMG5,<B,R1>            ;PRINT EXPECTED CONTENTS
        007324  005046                                                          CLR     -(SP)
        007326  150116                                                          BISB    R1,(SP)
        007330  012746  011257                                                  MOV     #FMG5,-(SP)
        007334  012746  000002                                                  MOV     #2,-(SP)
        007340  010600                                                          MOV     SP,R0
        007342  104414                                                          TRAP    C$PNTB
        007344  062706  000006                                                  ADD     #6,SP
     51 007350                  ENDMSG
        007350                                                          L10007:
        007350  104423                                                          TRAP    C$MSG
     52
     53 007352                  BGNMSG  ERRG10
        007352                                                          ERRG10::
     54 007352                          PRINTB  #FMG4                   ;PRINT HEADER
        007352  012746  011212                                                  MOV     #FMG4,-(SP)
        007356  012746  000001                                                  MOV     #1,-(SP)
        007362  010600                                                          MOV     SP,R0
        007364  104414                                                          TRAP    C$PNTB
        007366  062706  000004                                                  ADD     #4,SP
     55 007372                          PRINTB  #FMG13,CSR7,<B,@CSR7>   ;PRINT THE HIGH BYTE OF CSR6
        007372  005046                                                          CLR     -(SP)
        007374  157716  172706                                                BISB    @CSR7,(SP)
        007400  013746  002306                                                  MOV     CSR7,-(SP)
        007404  012746  011630                                                  MOV     #FMG13,-(SP)
        007410  012746  000003                                                  MOV     #3,-(SP)
        007414  010600                                                          MOV     SP,R0
        007416  104414                                                          TRAP    C$PNTB
        007420  062706  000010                                                  ADD     #10,SP
     56 007424                          PRINTB  #FMG5,<B,R1>            ;PRINT EXPECTED CONTENTS
        007424  005046                                                          CLR     -(SP)
        007426  150116                                                          BISB    R1,(SP)
        007430  012746  011257                                                  MOV     #FMG5,-(SP)
        007434  012746  000002                                                  MOV     #2,-(SP)
        007440  010600                                                          MOV     SP,R0
        007442  104414                                                          TRAP    C$PNTB
        007444  062706  000006                                                  ADD     #6,SP
     57 007450                  ENDMSG
        007450                                                          L10010:
        007450  104423                                                          TRAP    C$MSG
     58
     59
     60 007452                  BGNMSG  ERRG11
        007452                                                          ERRG11::
     61 007452  005737  002416          TST     SUBRPC                  ;WAS THE RESET ERROR FOUND IN THE SUB
     62 007456  001412                  BEQ     5$                      ;IF NOT SKIP
```

```
     63 007460                          PRINTB  #FMG23,SUBRPC          ;PRINT WHERE CALLED
        007460  013746  002416                                                MOV     SUBRPC,-(SP)
        007464  012746  012416                                                MOV     #FMG23,-(SP)
        007470  012746  000002                                                MOV     #2,-(SP)
        007474  010600                                                        MOV     SP,R0
        007476  104414                                                        TRAP    C$PNTB
        007500  062706  000006                                                ADD     #6,SP
     64 007504                          5$:
     65 007504                          PRINTB  #FMG4                   ;PRINT HEADER
        007504  012746  011212                                                MOV     #FMG4,-(SP)
        007510  012746  000001                                                MOV     #1,-(SP)
        007514  010600                                                        MOV     SP,R0
        007516  104414                                                        TRAP    C$PNTB
        007520  062706  000004                                                ADD     #4,SP
     66 007524                          PRINTB  #FMG7,CSR0,<B,@CSR0>    ;PRINT THE LOW BYTE OF CSR0
        007524  005046                                                        CLR     -(SP)
        007526  157716  172536                                              BISB    @CSR0,(SP)
        007532  013746  002270                                                MOV     CSR0,-(SP)
        007536  012746  011273                                                MOV     #FMG7,-(SP)
        007542  012746  000003                                                MOV     #3,-(SP)
        007546  010600                                                        MOV     SP,R0
        007550  104414                                                        TRAP    C$PNTB
        007552  062706  000010                                                ADD     #10,SP
     67 007556                          PRINTB  #FMG5,#0                ;PRINT EXPECTED CONTENTS
        007556  012746  000000                                                MOV     #0,-(SP)
        007562  012746  011257                                                MOV     #FMG5,-(SP)
        007566  012746  000002                                                MOV     #2,-(SP)
        007572  010600                                                        MOV     SP,R0
        007574  104414                                                        TRAP    C$PNTB
        007576  062706  000006                                                ADD     #6,SP
     68 007602                          PRINTB  #FMG10,CSR4,<B,@CSR4>   ;PRINT THE LOW BYTE OF CSR4
        007602  005046                                                        CLR     -(SP)
        007604  157716  172464                                              BISB    @CSR4,(SP)
        007610  013746  002274                                                MOV     CSR4,-(SP)
        007614  012746  011454                                                MOV     #FMG10,-(SP)
        007620  012746  000003                                                MOV     #3,-(SP)
        007624  010600                                                        MOV     SP,R0
        007626  104414                                                        TRAP    C$PNTB
        007630  062706  000010                                                ADD     #10,SP
     69 007634                          PRINTB  #FMG5,#TBE              ;PRINT EXPECTED CONTENTS
        007634  012746  000004                                                MOV     #TBE,-(SP)
        007640  012746  011257                                                MOV     #FMG5,-(SP)
        007644  012746  000002                                                MOV     #2,-(SP)
        007650  010600                                                        MOV     SP,R0
        007652  104414                                                        TRAP    C$PNTB
        007654  062706  000006                                                ADD     #6,SP
     70 007660                          PRINTB  #FMG11,PCR,<B,@PCR>     ;PRINT THE HIGH BYTE OF CSR4
        007660  005046                                                        CLR     -(SP)
        007662  157716  172416                                              BISB    @PCR,(SP)
        007666  013746  002304                                                MOV     PCR,-(SP)
        007672  012746  011520                                                MOV     #FMG11,-(SP)
        007676  012746  000003                                                MOV     #3,-(SP)
        007702  010600                                                        MOV     SP,R0
        007704  104414                                                        TRAP    C$PNTB
        007706  062706  000010                                                ADD     #10,SP
     71 007712                          PRINTB  #FMG5,#0                ;PRINT EXPECTED CONTENTS
        007712  012746  000000                                                MOV     #0,-(SP)
```

```
GLOBAL ERROR REPORT REPORT SECTION
        007716  012746  011257                                                 MOV     #FMG5,-(SP)
        007722  012746  000002                                                 MOV     #2,-(SP)
        007726  010600                                                         MOV     SP,R0
        007730  104414                                                         TRAP    C$PNTB
        007732  062706  000006                                                 ADD     #6,SP
    72  007736                          PRINTB  #FMG12,CSR6,<B,@CSR6>   ;PRINT THE LOW BYTE OF CSR6
        007736  005046                                                         CLR     -(SP)
        007740  157716  172332                                                 BISB    @CSR6,(SP)
        007744  013746  002276                                                 MOV     CSR6,-(SP)
        007750  012746  011564                                                 MOV     #FMG12,-(SP)
        007754  012746  000003                                                 MOV     #3,-(SP)
        007760  010600                                                         MOV     SP,R0
        007762  104414                                                         TRAP    C$PNTB
        007764  062706  000010                                                 ADD     #10,SP
    73  007770                          PRINTB  #FMG5,#0                ;PRINT EXPECTED CONTENTS
        007770  012746  000000                                                 MOV     #0,-(SP)
        007774  012746  011257                                                 MOV     #FMG5,-(SP)
        010000  012746  000002                                                 MOV     #2,-(SP)
        010004  010600                                                         MOV     SP,R0
        010006  104414                                                         TRAP    C$PNTB
        010010  062706  000006                                                 ADD     #6,SP
    74  010014                          PRINTB  #FMG13,CSR7,<B,@CSR7>   ;PRINT THE HIGH BYTE OF CSR6
        010014  005046                                                         CLR     -(SP)
        010016  157716  172264                                                 BISB    @CSR7,(SP)
        010022  013746  002306                                                 MOV     CSR7,-(SP)
        010026  012746  011630                                                 MOV     #FMG13,-(SP)
        010032  012746  000003                                                 MOV     #3,-(SP)
        010036  010600                                                         MOV     SP,R0
        010040  104414                                                         TRAP    C$PNTB
        010042  062706  000010                                                 ADD     #10,SP
    75  010046                          PRINTB  #FMG5,#0                ;PRINT EXPECTED CONTENTS
        010046  012746  000000                                                 MOV     #0,-(SP)
        010052  012746  011257                                                 MOV     #FMG5,-(SP)
        010056  012746  000002                                                 MOV     #2,-(SP)
        010062  010600                                                         MOV     SP,R0
        010064  104414                                                         TRAP    C$PNTB
        010066  062706  000006                                                 ADD     #6,SP
    76  010072              ENDMSG
        010072                                                          L10011:
        010072  104423                                                         TRAP    C$MSG
    77
    78  010074              BGNMSG  ERRG12
        010074                                                          ERRG12::
    79  010074                          PRINTB  #FMG3,SUBRPC            ;PC THAT SUBROUTINE WAS CALLED.
        010074  013746  002416                                                 MOV     SUBRPC,-(SP)
        010100  012746  011140                                                 MOV     #FMG3,-(SP)
        010104  012746  000002                                                 MOV     #2,-(SP)
        010110  010600                                                         MOV     SP,R0
        010112  104414                                                         TRAP    C$PNTB
        010114  062706  000006                                                 ADD     #6,SP
    80  010120                          PRINTB  #FMG14,REG,R1,R2        ;PRINT TIME OUT ERROR
        010120  010246                                                         MOV     R2,-(SP)
        010122  010146                                                         MOV     R1,-(SP)
        010124  013746  002374                                                 MOV     REG,-(SP)
        010130  012746  011674                                                 MOV     #FMG14,-(SP)
        010134  012746  000004                                                 MOV     #4,-(SP)
        010140  010600                                                         MOV     SP,R0
```

```
GLOBAL ERROR REPORT REPORT SECTION
        010142  104414                                                                  TRAP    C$PNTB
        010144  062706  000012                                                          ADD     #12,SP
     81 010150                          ENDMSG
        010150                                                                  L10012:
        010150  104423                                                                  TRAP    C$MSG
     82
     83 010152                          BGNMSG  ERRG13
        010152                                                                  ERRG13::
     84 010152  032777  000004  172110          BIT     #RTS,@RXCSR             ;IS RTS SET
     85 010160  001413                          BEQ     5$
     86 010162  012701  030004                  MOV     #RTS!CTS!RR,R1          ;SET UP THE EXPECTED RESULTS
     87 010166                                  PRINTB  #FMG17
        010166  012746  012024                                                          MOV     #FMG17,-(SP)
        010172  012746  000001                                                          MOV     #1,-(SP)
        010176  010600                                                                  MOV     SP,R0
        010200  104414                                                                  TRAP    C$PNTB
        010202  062706  000004                                                          ADD     #4,SP
     88 010206  000544                          BR      20$
     89 010210                          5$:
     90 010210  032777  000002  172052          BIT     #DTR,@RXCSR             ;IS DTR SET?
     91 010216  001413                          BEQ     10$                     ;BR IF NOT
     92 010220  012701  040002                  MOV     #DTR!IC,R1              ;SET UP THE EXPECTED RESULTS
     93 010224                                  PRINTB  #FMG18
        010224  012746  012101                                                          MOV     #FMG18,-(SP)
        010230  012746  000001                                                          MOV     #1,-(SP)
        010234  010600                                                                  MOV     SP,R0
        010236  104414                                                                  TRAP    C$PNTB
        010240  062706  000004                                                          ADD     #4,SP
     94 010244  000525                          BR      20$
     95 010246                          10$:
     96 010246  032777  000010  172014          BIT     #LL,@RXCSR              ;IS LOCAL LOOP SET
     97 010254  001433                          BEQ     15$
     98 010256  012701  001010                  MOV     #LL!DM,R1               ;SET UP THE EXPECTED RESULTS
     99 010262                                  PRINTB  #FMG19
        010262  012746  012150                                                          MOV     #FMG19,-(SP)
        010266  012746  000001                                                          MOV     #1,-(SP)
        010272  010600                                                                  MOV     SP,R0
        010274  104414                                                                  TRAP    C$PNTB
        010276  062706  000004                                                          ADD     #4,SP
    100 010302                                  PRINTB  #FMG21
        010302  012746  012302                                                          MOV     #FMG21,-(SP)
        010306  012746  000001                                                          MOV     #1,-(SP)
        010312  010600                                                                  MOV     SP,R0
        010314  104414                                                                  TRAP    C$PNTB
        010316  062706  000004                                                          ADD     #4,SP
    101 010322                                  PRINTB  #FMG29
        010322  012746  013075                                                          MOV     #FMG29,-(SP)
        010326  012746  000001                                                          MOV     #1,-(SP)
        010332  010600                                                                  MOV     SP,R0
        010334  104414                                                                  TRAP    C$PNTB
        010336  062706  000004                                                          ADD     #4,SP
    102 010342  000466                          BR      20$
    103
    104 010344                          15$:
    105 010344  032777  000001  171716          BIT     #SF,@RXCSR              ;IS SEL FREQ SET?
    106 010352  001520                          BEQ     25$                     ;IF NONE OF THOSE BITS SET - ERROR
    107 010354  012701  000040                  MOV     #SQ,R1                  ;SET UP THE EXPECTED RESULTS
```

```
    108 010360                          PRINTB  #FMG20
        010360  012746  012215                                                   MOV     #FMG20,-(SP)
        010364  012746  000001                                                   MOV     #1,-(SP)
        010370  010600                                                            MOV     SP,R0
        010372  104414                                                            TRAP    C$PNTB
        010374  062706  000004                                                    ADD     #4,SP
    109 010400                          PRINTB  #FMG21
        010400  012746  012302                                                   MOV     #FMG21,-(SP)
        010404  012746  000001                                                   MOV     #1,-(SP)
        010410  010600                                                            MOV     SP,R0
        010412  104414                                                            TRAP    C$PNTB
        010414  062706  000004                                                    ADD     #4,SP
    110 010420                          PRINTB  #FMG4               ;PRINT HEADER
        010420  012746  011212                                                   MOV     #FMG4,-(SP)
        010424  012746  000001                                                   MOV     #1,-(SP)
        010430  010600                                                            MOV     SP,R0
        010432  104414                                                            TRAP    C$PNTB
        010434  062706  000004                                                    ADD     #4,SP
    111 010440                          PRINTB  #FMG10,CSR4,<B,@CSR4>   ;PRINT THE LOW BYTE OF CSR4
        010440  005046                                                           CLR     -(SP)
        010442  157716  171626                                                   BISB    @CSR4,(SP)
        010446  013746  002274                                                   MOV     CSR4,-(SP)
        010452  012746  011454                                                   MOV     #FMG10,-(SP)
        010456  012746  000003                                                   MOV     #3,-(SP)
        010462  010600                                                            MOV     SP,R0
        010464  104414                                                            TRAP    C$PNTB
        010466  062706  000010                                                    ADD     #10,SP
    112 010472                          PRINTB  #FMG5,<B,R1>            ;PRINT EXPECTED CONTENTS
        010472  005046                                                           CLR     -(SP)
        010474  150116                                                           BISB    R1,(SP)
        010476  012746  011257                                                   MOV     #FMG5,-(SP)
        010502  012746  000002                                                   MOV     #2,-(SP)
        010506  010600                                                            MOV     SP,R0
        010510  104414                                                            TRAP    C$PNTB
        010512  062706  000006                                                    ADD     #6,SP
    113 010516  000447                  BR      30$
    114
    115 010520                      20$:
    116 010520                          PRINTB  #FMG4               ;PRINT HEADER
        010520  012746  011212                                                   MOV     #FMG4,-(SP)
        010524  012746  000001                                                   MOV     #1,-(SP)
        010530  010600                                                            MOV     SP,R0
        010532  104414                                                            TRAP    C$PNTB
        010534  062706  000004                                                    ADD     #4,SP
    117 010540                          PRINTB  #FMG15,CSR0,@CSR0       ;PRINT THE LOW BYTE OF CSR0
        010540  017746  171524                                                   MOV     @CSR0,-(SP)
        010544  013746  002270                                                   MOV     CSR0,-(SP)
        010550  012746  011751                                                   MOV     #FMG15,-(SP)
        010554  012746  000003                                                   MOV     #3,-(SP)
        010560  010600                                                            MOV     SP,R0
        010562  104414                                                            TRAP    C$PNTB
        010564  062706  000010                                                    ADD     #10,SP
    118 010570                          PRINTB  #FMG16,R1               ;PRINT EXPECTED CONTENTS
        010570  010146                                                           MOV     R1,-(SP)
        010572  012746  012013                                                   MOV     #FMG16,-(SP)
        010576  012746  000002                                                   MOV     #2,-(SP)
        010602  010600                                                           MOV     SP,R0
```

```
        010604  104414                                                          TRAP    C$PNTB
        010606  062706  000006                                                  ADD     #6,SP
    119 010612  000411                  BR      30$
    120 010614                      25$:
    121 010614                          PRINTB  #FMG22,R2               ;PRINT BIT THAT ISN'T WRITTEN.
        010614  010246                                                          MOV     R2,-(SP)
        010616  012746  012351                                                  MOV     #FMG22,-(SP)
        010622  012746  000002                                                  MOV     #2,-(SP)
        010626  010600                                                          MOV     SP,R0
        010630  104414                                                          TRAP    C$PNTB
        010632  062706  000006                                                  ADD     #6,SP
    122 010636                      30$:
    123 010636                          ENDMSG
        010636                                                              L10013:
        010636  104423                                                          TRAP    C$MSG
    124
    125 010640                          BGNMSG  ERRG14
        010640                                                              ERRG14::
    126 010640  005737  002416          TST     SUBRPC          ;IS THE ERROR IN A SUBROUTINE?
    127 010644  001412                  BEQ     10$             ;IF NOT, DON'T PRINT SUBR. PC
    128 010646                          PRINTB  #FMG3,SUBRPC    ;PC THAT SUBROUTINE WAS CALLED.
        010646  013746  002416                                                  MOV     SUBRPC,-(SP)
        010652  012746  011140                                                  MOV     #FMG3,-(SP)
        010656  012746  000002                                                  MOV     #2,-(SP)
        010662  010600                                                          MOV     SP,R0
        010664  104414                                                          TRAP    C$PNTB
        010666  062706  000006                                                  ADD     #6,SP
    129 010672                      10$:
    130 010672                          PRINTB  #FMG24,XMITD,RCOUNT     ;PRINT CHARACTERS XMITTED AND RCVD.
        010672  013746  002500                                                  MOV     RCOUNT,-(SP)
        010676  013746  002476                                                  MOV     XMITD,-(SP)
        010702  012746  012465                                                  MOV     #FMG24,-(SP)
        010706  012746  000003                                                  MOV     #3,-(SP)
        010712  010600                                                          MOV     SP,R0
        010714  104414                                                          TRAP    C$PNTB
        010716  062706  000010                                                  ADD     #10,SP
    131 010722                          ENDMSG
        010722                                                              L10014:
        010722  104423                                                          TRAP    C$MSG
    132
    133 010724                          BGNMSG  ERRG15
        010724                                                              ERRG15::
    134 010724                          PRINTB  #FMG25,R2               ;PRINT BIT THAT ISN'T CLEARED.
        010724  010246                                                          MOV     R2,-(SP)
        010726  012746  012532                                                  MOV     #FMG25,-(SP)
        010732  012746  000002                                                  MOV     #2,-(SP)
        010736  010600                                                          MOV     SP,R0
        010740  104414                                                          TRAP    C$PNTB
        010742  062706  000006                                                  ADD     #6,SP
    135 010746                          ENDMSG
        010746                                                              L10015:
        010746  104423                                                          TRAP    C$MSG
    136
    137 010750      045     101     125 FMG0:   .ASCIZ  /%AUNABLE TO RUN TEST %D2%A ON UNIT %D2%A WITHOUT TURNAROUND%N/
        010753      116     101     102
        010756      114     105     040
        010761      124     117     040
```

GLOBAL ERROR REPORT REPORT SECTION

```
        010764      122     125     116
        010767      040     124     105
        010772      123     124     040
        010775      045     104     062
        011000      045     101     040
        011003      117     116     040
        011006      125     116     111
        011011      124     040     045
        011014      104     062     045
        011017      101     040     127
        011022      111     124     110
        011025      117     125     124
        011030      040     124     125
        011033      122     116     101
        011036      122     117     125
        011041      116     104     045
        011044      116     000
   138  011046      045     101     122  FMG1:   .ASCIZ  /%ARXCSR: %O6%N%ARDSR : %O6%N/
        011051      130     103     123
        011054      122     072     040
        011057      045     117     066
        011062      045     116     045
        011065      101     122     104
        011070      123     122     040
        011073      072     040     045
        011076      117     066     045
        011101      116     000
   139  011103      045     101     124  FMG2:   .ASCIZ  /%ATXCSR: %O6%N%ATDSR : %O6%N/
        011106      130     103     123
        011111      122     072     040
        011114      045     117     066
        011117      045     116     045
        011122      101     124     104
        011125      123     122     040
        011130      072     040     045
        011133      117     066     045
        011136      116     000
   140  011140      045     101     105  FMG3:   .ASCIZ  /%AERROR IN SUBROUTINE CALLED AT PC: %O6%N/
        011143      122     122     117
        011146      122     040     111
        011151      116     040     123
        011154      125     102     122
        011157      117     125     124
        011162      111     116     105
        011165      040     103     101
        011170      114     114     105
        011173      104     040     101
        011176      124     040     120
        011201      103     072     040
        011204      045     117     066
        011207      045     116     000
   141  011212      045     123     071  FMG4:   .ASCIZ  /%S9%S9%S9%S3%AFOUND:%S2%AEXPECTED:%N/
        011215      045     123     071
        011220      045     123     071
        011223      045     123     063
        011226      045     101     106
        011231      117     125     116
```

GLOBAL ERROR REPORT REPORT SECTION

```
        011234  104     072     045
        011237  123     062     045
        011242  101     105     130
        011245  120     105     103
        011250  124     105     104
        011253  072     045     116
        011256  000
    142 011257  045     123     067  FMG5:   .ASCIZ  /%S7%03%N/
        011262  045     117     063
        011265  045     116     000
    143 011270  045     116     000  FMG6:   .ASCIZ  /%N/
    144 011273  045     101     122  FMG7:   .ASCIZ  /%ARXCSR    = %06%A (EXTERNAL):  %03/
        011276  130     103     123
        011301  122     040     040
        011304  040     040     075
        011307  040     045     117
        011312  066     045     101
        011315  040     050     105
        011320  130     124     105
        011323  122     116     101
        011326  114     051     072
        011331  040     040     045
        011334  117     063     000
    145 011337  045     101     130  FMG8:   .ASCIZ  /%AXMIT DATA: %03%A RCV DATA: %03%N/
        011342  115     111     124
        011345  040     104     101
        011350  124     101     072
        011353  040     045     117
        011356  063     045     101
        011361  040     122     103
        011364  126     040     104
        011367  101     124     101
        011372  072     040     045
        011375  117     063     045
        011400  116     000
    146 011402  045     116     045  FMG9:   .ASCIZ  /%N%A** CHECK -V FROM THE CHARGE PUMP **%N/
        011405  101     052     052
        011410  040     103     110
        011413  105     103     113
        011416  040     055     126
        011421  040     106     122
        011424  117     115     040
        011427  124     110     105
        011432  040     103     110
        011435  101     122     107
        011440  105     040     120
        011443  125     115     120
        011446  040     052     052
        011451  045     116     000
    147 011454  045     101     124  FMG10:  .ASCIZ  /%ATXCSR    = %06%A (EXTERNAL):  %03/
        011457  130     103     123
        011462  122     040     040
        011465  040     040     075
        011470  040     045     117
        011473  066     045     101
        011476  040     050     105
        011501  130     124     105
```

```
GLOBAL ERROR REPORT REPORT SECTION
          011504    122     116     101
          011507    114     051     072
          011512    040     040     045
          011515    117     063     000
    148   011520    045     101     120   FMG11:  .ASCIZ  /%APCR      = %06%A (USYNRT R7): %03/
          011523    103     122     040
          011526    040     040     040
          011531    040     040     075
          011534    040     045     117
          011537    066     045     101
          011542    040     050     125
          011545    123     131     116
          011550    122     124     040
          011553    122     067     051
          011556    072     040     045
          011561    117     063     000
    149   011564    045     101     124   FMG12:  .ASCIZ  /%AT. DATA  = %06%A (USYNRT R2): %03/
          011567    056     040     104
          011572    101     124     101
          011575    040     040     075
          011600    040     045     117
          011603    066     045     101
          011606    040     050     125
          011611    123     131     116
          011614    122     124     040
          011617    122     062     051
          011622    072     040     045
          011625    117     063     000
    150   011630    045     101     124   FMG13:  .ASCIZ  /%AT. STATUS- %06%A (USYNRT R3): %03/
          011633    056     040     123
          011636    124     101     124
          011641    125     123     075
          011644    040     045     117
          011647    066     045     101
          011652    040     050     125
          011655    123     131     116
          011660    122     124     040
          011663    122     063     051
          011666    072     040     045
          011671    117     063     000
    151   011674    045     101     103   FMG14:  .ASCIZ  /%ACONTENTS OF %06%A = %06%A   EXPECTED %06%N/
          011677    117     116     124
          011702    105     116     124
          011705    123     040     117
          011710    106     040     045
          011713    117     066     045
          011716    101     040     075
          011721    040     045     117
          011724    066     045     101
          011727    040     040     040
          011732    105     130     120
          011735    105     103     124
          011740    105     104     040
          011743    045     117     066
          011746    045     116     000
    152   011751    045     101     122   FMG15:  .ASCIZ  /%ARXCSR    = %06%A (EXTERNAL): %06/
          011754    130     103     123
```

GLOBAL ERROR REPORT REPORT SECTION

```
        011757  122     040     040
        011762  040     075     040
        011765  045     117     066
        011770  045     101     040
        011773  050     105     130
        011776  124     105     122
        012001  116     101     114
        012004  051     072     040
        012007  045     117     066
        012012  000
    153 012013  045     123     063  FMG16:  .ASCIZ  /%S3%06%N/
        012016  045     117     066
        012021  045     116     000
    154 012024  045     101     122  FMG17:  .ASCIZ  /%ARTS NOT TURNED AROUND TO CTS AND RR (CD)%N/
        012027  124     123     040
        012032  116     117     124
        012035  040     124     125
        012040  122     116     105
        012043  104     040     101
        012046  122     117     125
        012051  116     104     040
        012054  124     117     040
        012057  103     124     123
        012062  040     101     116
        012065  104     040     122
        012070  122     040     050
        012073  103     104     051
        012076  045     116     000
    155 012101  045     101     104  FMG18:  .ASCIZ  /%ADTR NOT TURNED AROUND TO IC (RING)%N/
        012104  124     122     040
        012107  116     117     124
        012112  040     124     125
        012115  122     116     105
        012120  104     040     101
        012123  122     117     125
        012126  116     104     040
        012131  124     117     040
        012134  111     103     040
        012137  050     122     111
        012142  116     107     051
        012145  045     116     000
    156 012150  045     101     114  FMG19:  .ASCIZ  /%ALL NOT TURNED AROUND TO DM (DSR)%N/
        012153  114     040     116
        012156  117     124     040
        012161  124     125     122
        012164  116     105     104
        012167  040     101     122
        012172  117     125     116
        012175  104     040     124
        012200  117     040     104
        012203  115     040     050
        012206  104     123     122
        012211  051     045     116
        012214  000
    157 012215  045     101     122  FMG20:  .ASCIZ  /%ARL NOT TURNED AROUND TO TEST MODE (SIG. QUALITY)%N/
        012220  114     040     116
        012223  117     124     040
```

GLOBAL ERROR REPORT REPORT SECTION

```
                012226  124     125     122
                012231  116     105     104
                012234  040     101     122
                012237  117     125     116
                012242  104     040     124
                012245  117     040     124
                012250  105     123     124
                012253  040     115     117
                012256  104     105     040
                012261  050     123     111
                012264  107     056     040
                012267  121     125     101
                012272  114     111     124
                012275  131     051     045
                012300  116     000
    158         012302  045     101     103  FMG21:  .ASCIZ  /%ACHECK THAT THE JUMPER IS INSTALLED%N/
                012305  110     105     103
                012310  113     040     124
                012313  110     101     124
                012316  040     124     110
                012321  105     040     112
                012324  125     115     120
                012327  105     122     040
                012332  111     123     040
                012335  111     116     123
                012340  124     101     114
                012343  114     105     104
                012346  045     116     000
    159         012351  045     101     103  FMG22:  .ASCIZ  /%ACAN'T WRITE BIT %06%A INTO RXCSR%N/
                012354  101     116     047
                012357  124     040     127
                012362  122     111     124
                012365  105     040     102
                012370  111     124     040
                012373  045     117     066
                012376  045     101     040
                012401  111     116     124
                012404  117     040     122
                012407  130     103     123
                012412  122     045     116
                012415  000
    160         012416  045     101     122  FMG23:  .ASCIZ  /%ARESET SUBROUTINE CALLED AT PC: %06%N/
                012421  105     123     105
                012424  124     040     123
                012427  125     102     122
                012432  117     125     124
                012435  111     116     105
                012440  040     103     101
                012443  114     114     105
                012446  104     040     101
                012451  124     040     120
                012454  103     072     040
                012457  045     117     066
                012462  045     116     000
    161         012465  045     101     124  FMG24:  .ASCIZ  /%ATRANSMITTED: %D2%A RECEIVED: %D2%N/
                012470  122     101     116
                012473  123     115     111
```

```
GLOBAL ERROR REPORT REPORT SECTION
        012476  124     124     105
        012501  104     072     040
        012504  045     104     062
        012507  045     101     040
        012512  122     105     103
        012515  105     111     126
        012520  105     104     072
        012523  040     045     104
        012526  062     045     116
        012531  000
    162 012532  045     101     103  FMG25:  .ASCIZ  /%ACAN'T CLEAR BIT %06%A IN RXCSR%N/
        012535  101     116     047
        012540  124     040     103
        012543  114     105     101
        012546  122     040     102
        012551  111     124     040
        012554  045     117     066
        012557  045     101     040
        012562  111     116     040
        012565  122     130     103
        012570  123     122     045
        012573  116     000
    163 012575  045     101     116  FMG26:  .ASCIZ  /%ANOTE: DATA SET INTERRUPT MAY BE DISABLED - CHECK JUMPER%N/
        012600  117     124     105
        012603  072     040     104
        012606  101     124     101
        012611  040     123     105
        012614  124     040     111
        012617  116     124     105
        012622  122     122     125
        012625  120     124     040
        012630  115     101     131
        012633  040     102     105
        012636  040     104     111
        012641  123     101     102
        012644  114     105     104
        012647  040     055     040
        012652  103     110     105
        012655  103     113     040
        012660  112     125     115
        012663  120     105     122
        012666  045     116     000
    164 012671  045     101     124  FMG27:  .ASCIZ  /%ATEST %D2%A - UNABLE TO RUN RS422 ON THIS LSI11%N/
        012674  105     123     124
        012677  040     045     104
        012702  062     045     101
        012705  040     055     040
        012710  125     116     101
        012713  102     114     105
        012716  040     124     117
        012721  040     122     125
        012724  116     040     122
        012727  123     064     062
        012732  062     040     117
        012735  116     040     124
        012740  110     111     123
        012743  040     114     123
```

GLOBAL ERROR REPORT REPORT SECTION

```
        012746  111     061     061
        012751  045     116     000
    165 012754  045     101     111     FMG28:  .ASCII  /%AIF CPU IS A M7264 WITH MEMORY REFRESH ENABLED, A HIGH/
        012757  106     040     103
        012762  120     125     040
        012765  111     123     040
        012770  101     040     115
        012773  067     062     066
        012776  064     040     127
        013001  111     124     110
        013004  040     115     105
        013007  115     117     122
        013012  131     040     122
        013015  105     106     122
        013020  105     123     110
        013023  040     105     116
        013026  101     102     114
        013031  105     104     054
        013034  040     101     040
        013037  110     111     107
        013042  110
    166 013043  045     101     040             .ASCIZ  /%A SPEED TEST CAN'T RUN%N/
        013046  123     120     105
        013051  105     104     040
        013054  124     105     123
        013057  124     040     103
        013062  101     116     047
        013065  124     040     122
        013070  125     116     045
        013073  116     000
    167 013075  045     101     052     FMG29:  .ASCIZ  /%A** IF M8020 JUMPERED FOR RS422, THIS ERROR EXPECTED **%N/
        013100  052     040     111
        013103  106     040     115
        013106  070     060     062
        013111  060     040     112
        013114  125     115     120
        013117  105     122     105
        013122  104     040     106
        013125  117     122     040
        013130  122     123     064
        013133  062     062     054
        013136  040     124     110
        013141  111     123     040
        013144  105     122     122
        013147  117     122     040
        013152  105     130     120
        013155  105     103     124
        013160  105     104     040
        013163  052     052     045
        013166  116     000
    168 013170  045     101     052     FMG30:  .ASCIZ  /%A** CHECK BYTE OP SIGNAL - STUCK LOW ?? **%N/
        013173  052     040     103
        013176  110     105     103
        013201  113     040     102
        013204  131     124     105
        013207  040     117     120
        013212  040     123     111
```

GLOBAL ERROR REPORT REPORT SECTION

```
          013215    107     116     101
          013220    114     040     055
          013223    040     123     124
          013226    125     103     113
          013231    040     114     117
          013234    127     040     077
          013237    077     040     052
          013242    052     045     116
          013245    000
    169
    170 013246    122     105     123   EMG0:   .ASCIZ  /RESET ERROR AFTER BUS RESET (DETECTED ONLY ON 1ST PASS)/
          013251    105     124     040
          013254    105     122     122
          013257    117     122     040
          013262    101     106     124
          013265    105     122     040
          013270    102     125     123
          013273    040     122     105
          013276    123     105     124
          013301    040     050     104
          013304    105     124     105
          013307    103     124     105
          013312    104     040     117
          013315    116     114     131
          013320    040     117     116
          013323    040     061     123
          013326    124     040     120
          013331    101     123     123
          013334    051     000
    171 013336    124     111     115   EMG1:   .ASCIZ  /TIME OUT/
          013341    105     040     117
          013344    125     124     000
    172 013347    124     111     115   EMG2:   .ASCIZ  /TIME OUT - DURING INTERRUPT EXERCISE/
          013352    105     040     117
          013355    125     124     040
          013360    055     040     104
          013363    125     122     111
          013366    116     107     040
          013371    111     116     124
          013374    105     122     122
          013377    125     120     124
          013402    040     105     130
          013405    105     122     103
          013410    111     123     105
          013413    000
    173 013414    122     105     123   EMG3:   .ASCIZ  /RESET ERROR/
          013417    105     124     040
          013422    105     122     122
          013425    117     122     000
    174 013430    103     123     122   EMG4:   .ASCIZ  /CSR READ-WRITE ERROR/
          013433    040     122     105
          013436    101     104     055
          013441    127     122     111
          013444    124     105     040
          013447    105     122     122
          013452    117     122     000
    175 013455    125     123     131   EMG5:   .ASCIZ  /USYNRT XMIT ACTIVE NOT SET/
```

GLOBAL ERROR REPORT REPORT SECTION

```
          013460  116  122  124
          013463  040  130  115
          013466  111  124  040
          013471  101  103  124
          013474  111  126  105
          013477  040  116  117
          013502  124  040  123
          013505  105  124  000
    176   013510  125  123  131  EMG6:   .ASCIZ  /USYNRT XMIT ACTIVE NOT CLEAR/
          013513  116  122  124
          013516  040  130  115
          013521  111  124  040
          013524  101  103  124
          013527  111  126  105
          013532  040  116  117
          013535  124  040  103
          013540  114  105  101
          013543  122  000
    177   013545  124  102  105  EMG7:   .ASCIZ  /TBE NOT CLEAR/
          013550  040  116  117
          013553  124  040  103
          013556  114  105  101
          013561  122  000
    178   013563  124  102  105  EMG8:   .ASCIZ  /TBE NOT SET/
          013566  040  116  117
          013571  124  040  123
          013574  105  124  000
    179   013577  130  115  111  EMG9:   .ASCIZ  /XMIT INTERRUPT NOT RECEIVED/
          013602  124  040  111
          013605  116  124  105
          013610  122  122  125
          013613  120  124  040
          013616  116  117  124
          013621  040  122  105
          013624  103  105  111
          013627  126  105  104
          013632  000
    180   013633  130  115  111  EMG10:  .ASCIZ  /XMIT INTERRUPT RECEIVED WHEN NOT EXPECTED/
          013636  124  040  111
          013641  116  124  105
          013644  122  122  125
          013647  120  124  040
          013652  122  105  103
          013655  105  111  126
          013660  105  104  040
          013663  127  110  105
          013666  116  040  116
          013671  117  124  040
          013674  105  130  120
          013677  105  103  124
          013702  105  104  000
    181   013705  122  105  103  EMG11:  .ASCIZ  /RECEIVER NOT DEACTIVATED/
          013710  105  111  126
          013713  105  122  040
          013716  116  117  124
          013721  040  104  105
          013724  101  103  124
```

GLOBAL ERROR REPORT REPORT SECTION

```
                013727  111     126     101
                013732  124     105     104
                013735  000
    182         013736  122     105     103     EMG12:  .ASCIZ  /RECEIVER NOT ACTIVE/
                013741  105     111     126
                013744  105     122     040
                013747  116     117     124
                013752  040     101     103
                013755  124     111     126
                013760  105     000
    183         013762  122     105     103     EMG13:  .ASCIZ  /RECEIVER NOT INITIALIZED AFTER RECEIVER DISABLED/
                013765  105     111     126
                013770  105     122     040
                013773  116     117     124
                013776  040     111     116
                014001  111     124     111
                014004  101     114     111
                014007  132     105     104
                014012  040     101     106
                014015  124     105     122
                014020  040     122     105
                014023  103     105     111
                014026  126     105     122
                014031  040     104     111
                014034  123     101     102
                014037  114     105     104
                014042  000
    184         014043  122     105     103     EMG14:  .ASCIZ  /RECEIVER ACTIVE BEFORE FIRST DATA CHARACTER/
                014046  105     111     126
                014051  105     122     040
                014054  101     103     124
                014057  111     126     105
                014062  040     102     105
                014065  106     117     122
                014070  105     040     106
                014073  111     122     123
                014076  124     040     104
                014101  101     124     101
                014104  040     103     110
                014107  101     122     101
                014112  103     124     105
                014115  122     000
    185         014117  122     103     126     EMG15:  .ASCIZ  /RCV INTERRUPT NOT RECEIVED/
                014122  040     111     116
                014125  124     105     122
                014130  122     125     120
                014133  124     040     116
                014136  117     124     040
                014141  122     105     103
                014144  105     111     126
                014147  105     104     000
    186         014152  122     103     126     EMG16:  .ASCIZ  /RCV INTERRUPT RECEIVED BEFORE EXPECTED/
                014155  040     111     116
                014160  124     105     122
                014163  122     125     120
                014166  124     040     122
                014171  105     103     105
```

GLOBAL ERROR REPORT REPORT SECTION

```
        014174  111     126     105
        014177  104     040     102
        014202  105     106     117
        014205  122     105     040
        014210  105     130     120
        014213  105     103     124
        014216  105     104     000
    187 014221  122     103     126  EMG17:  .ASCIZ  /RCV END OF MESSAGE NOT RECEIVED/
        014224  040     105     116
        014227  104     040     117
        014232  106     040     115
        014235  105     123     123
        014240  101     107     105
        014243  040     116     117
        014246  124     040     122
        014251  105     103     105
        014254  111     126     105
        014257  104     000
    188 014261  122     103     126  EMG18:  .ASCIZ  /RCV STATUS NOT CLEARED/
        014264  040     123     124
        014267  101     124     125
        014272  123     04      116
        014275  117     124     040
        014300  103     114     105
        014303  101     122     105
        014306  104     000
    189 014310  122     103     126  EMG19:  .ASCIZ  /RCV OVERRUN NOT RECEIVED/
        014313  040     117     126
        014316  105     122     122
        014321  125     116     040
        014324  116     117     124
        014327  040     122     105
        014332  103     105     111
        014335  126     105     104
        014340  000
    190 014341  122     103     126  EMG20:  .ASCIZ  /RCV ABORT NOT RECEIVED/
        014344  040     101     102
        014347  117     122     124
        014352  040     116     117
        014355  124     040     122
        014360  105     103     105
        014363  111     126     105
        014366  104     000
    191 014370  122     103     126  EMG21:  .ASCIZ  /RCV STATUS INTERRUPT NOT RECEIVED/
        014373  040     123     124
        014376  101     124     125
        014401  123     040     111
        014404  116     124     105
        014407  122     122     125
        014412  120     124     040
        014415  116     117     124
        014420  040     122     105
        014423  103     105     111
        014426  126     105     104
        014431  000
    192 014432  115     117     104  EMG22:  .ASCIZ  /MODEM LOOPBACK ERROR/
        014435  105     115     040
```

GLOBAL ERROR REPORT REPORT SECTION

```
        014440      114     117     117
        014443      120     102     101
        014446      103     113     040
        014451      105     122     122
        014454      117     122     000
193     014457      115     117     104   EMG23:  .ASCIZ  /MODEM STATUS INTERRUPT RECEIVED WHEN DISABLED/
        014462      105     115     040
        014465      123     124     101
        014470      124     125     123
        014473      040     111     116
        014476      124     105     122
        014501      122     125     120
        014504      124     040     122
        014507      105     103     105
        014512      111     126     105
        014515      104     040     127
        014520      110     105     116
        014523      040     104     111
        014526      123     101     102
        014531      114     105     104
        014534      000
194     014535      115     117     104   EMG24:  .ASCIZ  /MODEM STATUS INTERRUPT NOT RECEIVED/
        014540      105     115     040
        014543      123     124     101
        014546      124     125     123
        014551      040     111     116
        014554      124     105     122
        014557      122     125     120
        014562      124     040     116
        014565      117     124     040
        014570      122     105     103
        014573      105     111     126
        014576      105     104     000
195     014601      103     110     101   EMG25:  .ASCIZ  /CHARACTER COUNT ERROR/
        014604      122     101     103
        014607      124     105     122
        014612      040     103     117
        014615      125     116     124
        014620      040     105     122
        014623      122     117     122
        014626      000
196     014627      104     101     124   EMG26:  .ASCIZ  /DATA ERROR/
        014632      101     040     105
        014635      122     122     117
        014640      122     000
197     014642      130     115     111   EMG30:  .ASCIZ  /XMIT UNDERRUN/
        014645      124     040     125
        014650      116     104     105
        014653      122     122     125
        014656      116     000
198     014660      122     105     103   EMG31:  .ASCIZ  /RECEIVER ERROR/
        014663      105     111     126
        014666      105     122     040
        014671      105     122     122
        014674      117     122     000
199     014677      101     102     117   EMG32:  .ASCIZ  /ABORT NOT RECEIVED/
        014702      122     124     040
```

```
GLOBAL ERROR REPORT REPORT SECTION
        014705  116  117  124
        014710  040  122  105
        014713  103  105  111
        014716  126  105  104
        014721  000
    200 014722  107  117  040  EMG33:  .ASCIZ  /GO AHEAD NOT RECEIVED/
        014725  101  110  105
        014730  101  104  040
        014733  116  117  124
        014736  040  122  105
        014741  103  105  111
        014744  126  105  104
        014747  000
    201 014750  101  102  117  EMG34:  .ASCIZ  /ABORT RECEIVED WHEN NOT EXPECTED/
        014753  122  124  040
        014756  122  105  103
        014761  105  111  126
        014764  105  104  040
        014767  127  110  105
        014772  116  040  116
        014775  117  124  040
        015000  105  130  120
        015003  105  103  124
        015006  105  104  000
    202 015011  101  104  104  EMG35:  .ASCIZ  /ADDRESS INCORRECTLY RECOGNIZED/
        015014  122  105  123
        015017  123  040  111
        015022  116  103  117
        015025  122  122  105
        015030  103  124  114
        015033  131  040  122
        015036  105  103  117
        015041  107  116  111
        015044  132  105  104
        015047  000
    203 015050  101  123  123  EMG36:  .ASCIZ  /ASSEMBLED BIT COUNT ERROR/
        015053  105  115  102
        015056  114  105  104
        015061  040  102  111
        015064  124  040  103
        015067  117  125  116
        015072  124  040  105
        015075  122  122  117
        015100  122  000
    204 015102  103  122  103  EMG37:  .ASCIZ  /CRC ERROR/
        015105  040  105  122
        015110  122  117  122
        015113  000
    205 015114  103  122  103  EMG38:  .ASCIZ  /CRC ERROR NOT DETECTED/
        015117  040  105  122
        015122  122  117  122
        015125  040  116  117
        015130  124  040  104
        015133  105  124  105
        015136  103  124  105
        015141  104  000
    206 015143  120  101  122  EMG39:  .ASCIZ  /PARITY ERROR NOT DETECTED/
```

GLOBAL ERROR REPORT REPORT SECTION

```
        015146  111     124     131
        015151  040     105     122
        015154  122     117     122
        015157  040     116     117
        015162  124     040     104
        015165  105     124     105
        015170  103     124     105
        015173  104     000
    207 015175  115     125     114  EMG40:  .ASCIZ  /MULTIPLE MODEM CONTROL INTERRUPTS/
        015200  124     111     120
        015203  114     105     040
        015206  115     117     104
        015211  105     115     040
        015214  103     117     116
        015217  124     122     117
        015222  114     040     111
        015225  116     124     105
        015230  122     122     125
        015233  120     124     123
        015236  000
    208                                  .EVEN
    209
```

LOAD DEVICE PROTECTION TABLE

```
                                .SBTTL  LOAD DEVICE PROTECTION TABLE

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

 015240                                 BGNPROT
 015240                                                                 L$PROT::

 015240  177777                         .WORD   -1              ;DON'T CHECK CSR ADDRESS
 015242  177777                         .WORD   -1              ;DON'T CHECK MASSBUS UNIT NUMBER
 015244  177777                         .WORD   -1              ;DON'T CHECK DRIVE NUMBER

 015246                                 ENDPROT
```

```
                                .SBTTL  INITIALIZE SECTION

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

015246                          BGNINIT
015246                                                                          L$INIT::

                                        SETPRI  #PRIO7          ;SET DIAGNOSTIC PRIORITY = 7
015246  012700  000340                                                                  MOV     #PRIO7,R0
015252  104441                                                                          TRAP    C$SPRI
015254  010637  002372                  MOV     SP,PSTACK       ;STORE BASE LEVEL PROGRAM STACK POINTER
015260  005037  002416                  CLR     SUBRPC          ;CLEAR STORAGE WORD FOR SUBROUTINE PC CALL
015264  005037  002332                  CLR     ERROR           ;CLEAR ERROR FLAGS
015270  005037  002336                  CLR     FLAG            ;CLEAR MISC. FLAGS
015274  005037  002376                  CLR     RFLAG
015300  005037  002424                  CLR     TFLAG
015304  005037  002366                  CLR     NXMFLG          ;NXM FLAG
015310  005037  002322                  CLR     ABORT
015314  005037  002432                  CLR     TOGGLE
015320  005037  002370                  CLR     OVER

015324  005737  002314                  TST     FRSTIM          ;IS THIS THE TIME THROUGH AFTER LOAD?
015330  001005                          BNE     1$              ;IF NOT - ERROR TRAP VECTOR ALREADY SAVED
015332  012737  000001  002314          MOV     #1,FRSTIM       ;FLAG THAT WE'VE BEEN THRU THE 1ST TIME
015340  005037  002316                  CLR     FRSPAS          ;CLEAR COUNTER FOR # OF PASSES AFTER LOAD

015344                          1$:
                                        CLRVEC  #4              ;ENSURE VECTOR 4 IS IN NORMAL STATE.
015344  012700  000004                                                                  MOV     #4,R0
015350  104436                                                                          TRAP    C$CVEC

015352                                  READEF  #EF.START       ;IS THIS JUST STARTED?
015352  012700  000040                                                                  MOV     #EF.START,R0
015356  104447                                                                          TRAP    C$REFG
015360                                  BCOMPLETE STARST        ;IF YES - BRANCH.
015360  103416                                                                          BCS     STARST
015362                                  READEF  #EF.RESTART     ;IS THIS A RESTART ?
015362  012700  000037                                                                  MOV     #EF.RESTART,R0
015366  104447                                                                          TRAP    C$REFG
015370                                  BCOMPLETE STARST        ;IF YES - BRANCH.
015370  103412                                                                          BCS     STARST
015372                                  READEF  #EF.NEW         ;IS THIS A NEW PASS?
015372  012700  000035                                                                  MOV     #EF.NEW,R0
015376  104447                                                                          TRAP    C$REFG
015400                                  BCOMPLETE NEWST         ;IF YES - BRANCH
015400  103410                                                                          BCS     NEWST
015402                                  READEF  #EF.CONTINUE    ;IS THIS A CONTINUATION?
015402  012700  000036                                                                  MOV     #EF.CONTINUE,R0
015406  104447                                                                          TRAP    C$REFG
015410                                  BNCOMPLETE GETPRM       ;IF NOT - GET PARAMETERS
015410  103013                                                                          BCC     GETPRM
015412  000137  016122                  JMP     END             ;OTHERWISE - DON'T INITIALIZE.

015416                          STARST:
```

```
INITIALIZE SECTION
     41 015416  005037  002320                    CLR     STARES          ;CLEAR THE FLAG TO SHOW START/RESTART.
     42
     43 015422                              NEWST:
     44 015422  012737  177777  002354              MOV     #-1,LOGDEV      ;INITIALIZE LOGICAL UNIT NUMBER.
     45 015430  005237  002316                    INC     FRSPAS          ;INCREMENT # OF PASSES AFTER LOAD.
     46 015434  005237  002320                    INC     STARES          ;INCREMENT # OF PASSES SINCE START/RESTART.
     47 015440                              GETPRM:
     48 015440  005237  002354                    INC     LOGDEV          ;NEXT LOGICAL UNIT TO BE TESTED
     49 015444  023737  002354  002012            CMP     LOGDEV,L$UNIT   ;IS THE MAXIMUM UNIT # EXCEEDED?
     50 015452  002363                           BGE     NEWST           ;IF YES - DO A NEW START
     51 015454                                   GPHARD  LOGDEV,R1       ;GET THE P-TABLE POINTER INTO R1
        015454  013700  002354                                                           MOV     LOGDEV,R0
        015460  104442                                                                   TRAP    C$GPHRD
        015462  010001                                                                   MOV     R0,R1
     52 015464                                   BNCOMPLETE  GETPRM      ;IF NOT AVAILABLE, GET THE NEXT ONE
        015464  103365                                                                   BCC     GETPRM
     53 015466  011100                           MOV     (R1),R0         ;SAVE THE ADDRESS
     54 015470  032700  000007                   BIT     #7,R0           ;DOES THIS DEVICE ADDRESS END IN NON-ZERO?
     55 015474  001414                           BEQ     10$             ;IF NOT - OK (76XXX0)
     56 015476  042711  000007                   BIC     #7,(R1)         ;MAKE IT 76XXX0
     57 015502                                   PRINTB  #FINIT1,(R1),R0 ;INFORM THE USER
        015502  010046                                                                   MOV     R0,-(SP)
        015504  011146                                                                   MOV     (R1),-(SP)
        015506  012746  016124                                                           MOV     #FINIT1,-(SP)
        015512  012746  000003                                                           MOV     #3,-(SP)
        015516  010600                                                                   MOV     SP,R0
        015520  104414                                                                   TRAP    C$PNTB
        015522  062706  000010                                                           ADD     #10,SP
     58 015526                              10$:
     59 015526  011137  002270                    MOV     (R1),CSR0       ;CSR ADDRESS 0 = RECEIVER CSR (RXCSR)
     60                                                                                  ;                READ/WRITE
     61 015532  013737  002270  002300            MOV     CSR0,CSR1       ;SAVE HIGH BYTE ADDRESS
     62 015540  005237  002300                    INC     CSR1
     63 015544  011137  002272                    MOV     (R1),CSR2
     64 015550  062737  000002  002272            ADD     #2,CSR2         ;CSR ADDRESS 2 = RECEIVE DATA/STATUS (RDSR)
     65                                                                                  ;                READ ONLY
     66                                                                                  ;CSR ADDRESS 2 = PARAMETER CONTROL/SYNCH ADDR
     67                                                                                  ;                (PCSAR) - WRITE ONLY
     68 015556  013737  002272  002302            MOV     CSR2,CSR3       ;SAVE HIGH BYTE ADDRESS
     69 015564  005237  002302                    INC     CSR3
     70 015570  011137  002274                    MOV     (R1),CSR4
     71 015574  062737  000004  002274            ADD     #4,CSR4         ;CSR ADDRESS 4 = TRANSMITTER CSR (TXCSR)
     72                                                                                  ;                READ/WRITE
     73
     74 015602  013737  002274  002304            MOV     CSR4,CSR5       ;CSR ADDRESS 5 = PARAMETER CONTROL REG (PCR)
     75                                                                                  ;                READ/WRITE
     76 015610  005237  002304                    INC     CSR5            ;                PCR IS HI BYTE OF TXCSR
     77 015614  012137  002276                    MOV     (R1)+,CSR6
     78 015620  062737  000006  002276            ADD     #6,CSR6         ;CSR ADDRESS 6 = TRANSMIT DATA/STATUS (TDSR)
     79                                                                                  ;                READ/WRITE
     80 015626  013737  002276  002306            MOV     CSR6,CSR7       ;SAVE HIGH BYTE ADDRESS
     81 015634  005237  002306                    INC     CSR7
     82 015640  011100                           MOV     (R1),R0         ;GET VECTOR
     83 015642  032700  000007                   BIT     #7,R0           ;DOES THIS VECTOR END IN NON-ZERO?
     84 015646  001414                           BEQ     11$             ;IF NOT - OK (XX0)
     85 015650  042711  000007                   BIC     #7,(R1)         ;MAKE IT XX0
     86 015654                                   PRINTB  #FINIT2,(R1),R0 ;INFORM THE USER
```

INITIALIZE SECTION

```
015654  010046                                                          MOV     R0,-(SP)
015656  011146                                                          MOV     (R1),-(SP)
015660  012746  016217                                                  MOV     #FINIT2,-(SP)
015664  012746  000003                                                  MOV     #3,-(SP)
015670  010600                                                          MOV     SP,R0
015672  104414                                                          TRAP    C$PNTB
015674  062706  000010                                                  ADD     #10,SP
 87 015700                          11$:
 88 015700  011137  002264                      MOV     (R1),RCVEC      ;RCV. VECTOR
 89 015704  012137  002266                      MOV     (R1)+,XMTVEC    ;TRANSMIT VECTOR
 90 015710  062737  000004  002266              ADD     #4,XMTVEC       ;ADJUST XMIT VECTOR
 91
 92 015716  012137  002310                      MOV     (R1)+,TURN      ;TURNAROUND.
 93 015722  011137  002312                      MOV     (R1),CPU        ;CPU TYPE.
 94 015726  012737  000020  002402              MOV     #RXENA,RXINI    ;RECEIVER INIT WORD
 95 015734  012737  000020  002436              MOV     #TXENA,TXINI    ;TRANSMITTER INIT WORD
 96 015742  005737  002310                      TST     TURN            ;WHAT WAS THE TURNAROUND
 97 015746  001004                              BNE     15$             ;IF ACTUAL TURNAROUND DON'T SET MAINT MODE
 98 015750  052737  000010  002436              BIS     #MM,TXINI       ;SET THE MAINT. MODE BIT.
 99 015756  000422                              BR      20$
100 015760                          15$:
101 015760  052737  000004  002402              BIS     #RTS,RXINI      ;SET RTS FOR TURNAROUND LOOP.
102 015766  022737  000003  002310              CMP     #3,TURN         ;LOCAL LOOPBACK?
103 015774  001004                              BNE     17$             ;IF NOT SKIP.
104 015776  052737  000012  002402              BIS     #LL!DTR,RXINI   ;SET LOCAL LOOP AND DTR.
105 016004  000407                              BR      20$
106 016006                          17$:
107 016006  022737  000004  002310              CMP     #4,TURN         ;REMOTE LOOPBACK?
108 016014  001003                              BNE     20$
109 016016  052737  000003  002402              BIS     #DTR!RL,RXINI   ;SET REMOTE LOOP AND DTR
110 016024                          20$:
111 016024  013737  002402  002404              MOV     RXINI,RXINIT    ;SAVE RECEIVER INIT WORD
112 016032  052737  000140  002404              BIS     #RXITEN!DSITEN,RXINIT ;MAKE IT AN INTERRUPT INIT WORD
113 016040  013737  002436  002440              MOV     TXINI,TXINIT    ;SAVE TRANSMITTER INIT WORD
114 016046  052737  000100  002440              BIS     #TXIE,TXINIT    ;MAKE IT AN INTERRUPT INIT WORD
115 016054  012737  000120  002406              MOV     #RXITEN!RXENA,RXMINI    ;RCV INIT FOR MAINT. LOOP.
116 016062  012737  000130  002442              MOV     #TXIE!TXENA!MM,TXMINI   ;TRANS INIT WITH MAINT. LOOP.
117 016070  005737  002312                      TST     CPU             ;IS THE CPU A LSI11/23 ?
118 016074  001004                              BNE     25$             ;BR IF YES
119 016076  012737  000020  002430              MOV     #20,TIMER       ;SET THE TIMER FOR A LSI11 OR 11/2.
120 016104  000403                              BR      30$
121 016106                          25$:
122 016106  012737  000050  002430              MOV     #50,TIMER       ;SET THE TIMER FOR A LSI-11/23.
123 016114                          30$:
124 016114  013737  002430  002412              MOV     TIMER,SAVTIM    ;STORE THE TIMER VALUE.
125 016122                          END:
126 016122                          ENDINIT
    016122                                                                      L10017:
    016122  104411                                                                  TRAP    C$INIT
127 016124    045     101     052   FINIT1: .ASCIZ  /%A** WARNING - WILL ASSUME DPV ADDRESS %O6%A (NOT %O6%A)%N/
    016127    052     040     127
    016132    101     122     116
    016135    111     116     107
    016140    040     055     040
    016143    127     111     114
    016146    114     040     101
    016151    123     123     125
```

INITIALIZE SECTION

```
          016154   115   105   040
          016157   104   120   126
          016162   040   101   104
          016165   104   122   105
          016170   123   123   040
          016173   045   117   066
          016176   045   101   040
          016201   050   116   117
          016204   124   040   045
          016207   117   066   045
          016212   101   051   045
          016215   116   000
   128    016217   045   101   052  FINIT2: .ASCIZ  /%A** WARNING - WILL ASSUME DPV VECTOR  %03%A (NOT %03%A)%N/
          016222   052   040   127
          016225   101   122   116
          016230   111   116   107
          016233   040   055   040
          016236   127   111   114
          016241   114   040   101
          016244   123   123   125
          016247   115   105   040
          016252   104   120   126
          016255   040   126   105
          016260   103   124   117
          016263   122   040   040
          016266   045   117   063
          016271   045   101   040
          016274   050   116   117
          016277   124   040   045
          016302   117   063   045
          016305   101   051   045
          016310   116   000
   129                                .EVEN
   130
   131
   132
   133
   134
```

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

016312                  BGNAUTO
016312                                                          L$AUTO::
                                SETVEC  #4,#NXM,#PRI07  ;SET UP NON -EXISTENT MEMORY TRAP VECTOR.
016312  012746  000340                                                  MOV     #PRI07,-(SP)
016316  012746  017534                                                  MOV     #NXM,-(SP)
016322  012746  000004                                                  MOV     #4,-(SP)
016326  012746  000003                                                  MOV     #3,-(SP)
016332  104437                                                          TRAP    C$SVEC
016334  062706  000010                                                  ADD     #10,SP
016340  005037  002366                CLR     NXMFLG          ;CLEAR FLAG USED IN TEST
016344  005777  163720                TST     @CSR0           ;REFERENCE MEMORY ADDRESS FOR THE DEVICE
                                                                ;TO SEE IF IT EXISTS.

                        ;;**************************************************************************
                        ; IF THE DEVICE DOESN'T EXIST THE RESULTANT TRAP TO VECTOR 04 WILL
                        ; CAUSE THE DEVICE TO BE DROPPED (SEE INTERRUPT ROUTINE 'DROP04').
                        ; OTHERWISE THE MEMORY REFERENCE IS UNEVENTFUL AND THE DEVICE IS READY.
                        ;;**************************************************************************
016350  005737  002366                TST     NXMFLG          ;WAS THERE A TRAP?
016354  001407                        BEQ     10$             ;BR IF NOT
016356                                  DODU    LOGDEV          ;DROP THE DEVICE
016356  013700  002354                                                  MOV     LOGDEV,R0
016362  104451                                                          TRAP    C$DODU
016364                                  DOCLN                   ;CLEAN UP CODE.
016364  104444                                                          TRAP    C$DCLN
016366                                  CLRVEC  #4              ;RETURN VECTOR 04 TO NORMAL STATE
016366  012700  000004                                                  MOV     #4,R0
016372  104436                                                          TRAP    C$CVEC
016374                          10$:

016374                  ENDAUTO
016374                                                          L10020:
016374  104461                                                          TRAP    C$AUTO
```

CLEANUP CODING SECTION

```
                                .SBTTL  CLEANUP CODING SECTION

                                ;////////////////////////////////////////////////////////////////////////
                                ;/  THE CLEANUP CODING SECTION CONTAINS THE CODING THAT IS PERFORMED AT THE
                                ;/  END OF THE TEST SEQUENCE ON A PARTICULAR UNIT.  THIS SECTION IS REQUIRED
                                ;/  EVEN IF IT IS A NULL CLEANUP
                                ;////////////////////////////////////////////////////////////////////////

016376                          BGNCLN
016376                                                                          L$CLEAN::
016376  005737  002366                  TST     NXMFLG          ;WAS THERE A NXM TRAP
016402  001003                          BNE     10$             ;IF YES, SKIP RESET
016404  012777  000001  163662          MOV     #RESET,@TXCSR   ;RESET THE DPV
016412                          10$:
016412                          ENDCLN
016412                                                                          L10021:
016412  104412                                                                          TRAP    C$CLEAN
```

GLOBAL INTERRUPT HANDLING ROUTINES

```
                        .SBTTL  GLOBAL INTERRUPT HANDLING ROUTINES

                        ;////////////////////////////////////////////////////////////////////
                        ;/ THE INTERRUPT HANDLING SECTION CONTAINS CODING REQUIRED TO USE
                        ;/ THE 'SETVEC' MACRO.  NOTE EVERY INTERRUPT ROUTINE SHOULD SAVE
                        ;/ AND RESTORE R0.
                        ;////////////////////////////////////////////////////////////////////

                        ;*********************************************************************
                        ;       RINT -  INTERRUPT SERVICE ROUTINE
                        ;
                        ;       FUNCTION - RECEIVE INTERRUPT ROUTINE THAT SETS FLAGS WHEN
                        ;                  A RECEIVE INTERRUPT CONDITON IS RECEIVED.
                        ;
                        ;       ENTRY CONDTIONS
                        ;                       TOGGLE = IF NON ZERO, XOR THE BITS IN TOGGLE
                        ;                                INTO THE RXCSR
                        ;
                        ;       EXIT CONDITIONS RFLAG =  1 SET - DATA RECEIVED
                        ;                            =  2 SET - STATUS RECEIVED
                        ;                       IRXCSR=  IMAGE OF RXCSR
                        ;                       RSAVE =  IMAGE OF RDSR
                        ;                       MCFLAG=  MODEM CONTROL INTERRUPT COUNT.
                        ;
                        ;       USED IN TESTS: 8,10,11,13,14
                        ;
                        ;*********************************************************************


016414                  BGNSRV  RINT
016414                                                          RINT::
016414                  1$:
017737 163650 002346            MOV     @RXCSR,IRXCSR   ;SAVE RXCSR
016422 100011                   BPL     5$              ;BR IF NOT
005237 002360                   INC     MCFLAG          ;INCREMENT MODEM CONTROL FLAG.
022737 000002 002360            CMP     #2,MCFLAG       ;HAS THERE BEEN MORE THAN 2 INTERRUPTS?
002003                          BGE     5$              ;IF NOT, PROCEED.
042777 000040 163622            BIC     #DSITEN,@RXCSR  ;DISABLE THE INTERRUPT.
016446                  5$:
032737 000200 002346            BIT     #RDATRY,IRXCSR  ;IS DATA READY?
001414                          BEQ     10$             ;IF NOT - CHECK STATUS.
052737 000001 002376            BIS     #1,RFLAG        ;FLAG FOR DATA
005737 002432                   TST     TOGGLE          ;TOGGLE ?
001406                          BEQ     10$             ;IF NOT, SKIP TOGGLE
013702 002432                   MOV     TOGGLE,R2       ;GET THE TOGGLE VALUE
005037 002432                   CLR     TOGGLE          ;ONLY TOGGLE ONCE.
074277 163562                   XOR     R2,@RXCSR       ;TOGGLE RTS.
016506                  10$:
032737 002000 002346            BIT     #RSTARY,IRXCSR  ;IS STATUS READY?
001404                          BEQ     20$             ;IF NOT - DON'T SET THE FLAG.
052737 000002 002376            BIS     #2,RFLAG        ;SET THE FLAG
000403                          BR      25$
016526                  20$:
005737 002370                   TST     OVER            ;CREATE AN OVERRUN?
001330                          BNE     1$              ;IF YES - DON'T READ THE DATA
                                                        ;UNTIL THE STATUS FLAG IS SET.
016534                  25$:
```

GLOBAL INTERRUPT HANDLING ROUTINES

```
     57 016534  017737  163532  002400          MOV     @RDSR,RSAVE     ;SAVE RECEIVE DATA AND STATUS.
     58
     59 016542                          ENDSRV
        016542                                                                      L10022:
        016542  000002                                                                      RTI
     60
```

GLOBAL INTERRUPT HANDLING ROUTINES

```
                        ;*****************************************************************************
                        ;       RDATA - INTERRUPT SERVICE ROUTINE
                        ;
                        ;       FUNCTION - GENERAL PURPOSE RECEIVE INTERRUPT ROUTINE
                        ;
                        ;       ENTRY CONDTIONS
                        ;                       ECOUNT = # OF CHARACTERS TO BE RECEIVED.
                        ;                       R1     = ADDRESS OF BUFFER FOR NEXT CHARACTER
                        ;
                        ;       EXIT CONDITIONS
                        ;                       IRXCSR = IMAGE OF RXCSR
                        ;                       IRDSR  = IMAGE OF RDSR
                        ;                       RCOUNT = COUNT OF CHARACTERS RECEIVED
                        ;                       MODE   = PROTOCOL MODE ( 0 = BCP, NON 0 = BOP)
                        ;                       MCFLAG = COUNT OF MODEM CONTROL INTERRUPTS RECEIVED
                        ;                       MODEM  = ADDRESS OF MODEM CONTROL INTERRUPT TABLE
                        ;                       RFLAG  = RECEIVE END FLAG ( 1 = NO ERROR, -1 = ERROR)
                        ;                       R1     = INCREMENTED TO NEXT BYTE IN BUFFER.
                        ;
                        ;       USED IN TESTS: 15-28 & 30-40 (CALLED IN SUBROUTINE $DATA), 41
                        ;
                        ;*****************************************************************************

016544                  BGNSRV  RDATA
016544                                                                  RDATA::
016544  017737  163520  002346        MOV     @RXCSR,IRXCSR   ;SAVE THE RXCSR
016552  100040                        BPL     10$             ;IS DATA SET CHANGE?  IF NOT SET, BR.

016554  032737  000040  002346        BIT     #DSITEN,IRXCSR  ;WAS THE DATA SET CHANGE INT. ENABLED?
016562  001434                        BEQ     10$             ;IF NOT - DON'T KEEP TRACK OF THE CHANGES.
016564  005237  002360                INC     MCFLAG          ;INCR MODEM CONTROL FLAG.
016570  022737  000011  002360        CMP     #9.,MCFLAG      ;WERE TOO MANY INTERRUPTS RECECEIVED?
016576  002004                        BGE     1$              ;IF NOT - PROCEED.
016600  042777  000040  163462        BIC     #DSITEN,@RXCSR  ;CLEAR MODEM CONTROL INTERRUPT.
016606  000422                        BR      10$
016610                          1$:
016610                          PUSH    <R5>                ;SAVE R5
016612  013705  002360                MOV     MCFLAG,R5       ;USE THE INTERRUPT # AS A TABLE INDEX.
016616  006305                        ASL     R5              ;CHANGE MODEM CONTROL TO ADDRESS OFFSET
016620  013765  002346  002444        MOV     IRXCSR,MODEM(R5);SAVE THE MODEM STATUS
016626  042765  006760  002444        BIC     #6760,MODEM(R5) ;SAVE ONLY THE MODEM STATUS.
016634  032777  000040  163432        BIT     #TM,@TXCSR      ;WAS THE TEST MODE BIT SET?
016642  001403                        BEQ     5$              ;BR IF NOT
016644  052765  000040  002444        BIS     #TM,MODEM(R5)   ;SAVE TEST MODE STATUS.
016652                          5$:
016652                          POP     <R5>                ;RESTORE R5

016654                          10$:
016654  032737  002200  002346        BIT     #RSTARY!RDATRY,IRXCSR ;IS THE DATA OR STATUS BIT SET
016662  001444                        BEQ     55$
016664  017737  163402  002350        MOV     @RDSR,IRDSR     ;SAVE THE DATA AND STATUS REG.
016672  032737  000200  002346        BIT     #RDATRY,IRXCSR  ;IS DATA SET?
016700  001404                        BEQ     20$
016702  113721  002350                MOVB    IRDSR,(R1)+     ;SAVE THE DATA.
016706  005237  002500                INC     RCOUNT          ;INCREMENT BYTE COUNT
016712                          20$:
```

GLOBAL INTERRUPT HANDLING ROUTINES

```
     57 016712  032737  002000  002346          BIT     #RSTARY,IRXCSR  ;IS STATUS SET?
     58 016720  001410                          BEQ     50$
     59 016722  032737  106000  002350          BIT     #ERR!ROVER!RABORT,IRDSR ;WAS THERE AN ERROR?
     60 016730  001413                          BEQ     53$             ;IF NOT - MUST BE END OF MESSAGE.
     61 016732  012737  177777  002376          MOV     #-1,RFLAG       ;OTHERWISE, SET ERROR FLAG.
     62 016740  000412                          BR      54$
     63 016742                          50$:
     64 016742  005737  002362                  TST     MODE            ;IS THIS BCP?
     65 016746  001012                          BNE     55$             ;IF NOT - EXIT
     66 016750  023737  002500  002474          CMP     RCOUNT,ECOUNT   ;HAVE WE RECEIVED ALL THE CHARACTERS
     67 016756  001006                          BNE     55$             ;IF NOT - EXIT
     68 016760                          53$:
     69 016760  012737  000001  002376          MOV     #1,RFLAG        ;SET FLAG
     70 016766                          54$:
     71 016766  042777  000100  163274          BIC     #RXITEN,@RXCSR  ;DISABLE INTERRUPT
     72 016774                          55$:
     73
     74 016774                          ENDSRV
        016774                                                                  L10023:
        016774  000002                                                                  RTI
     75
     76
```

GLOBAL INTERRUPT HANDLING ROUTINES

```
                        ;*****************************************************************
                        ;       RDATA2 - INTERRUPT SERVICE ROUTINE
                        ;
                        ;       FUNCTION - HIGH SPEED RECEIVE INTERRUPT ROUTINE
                        ;
                        ;       ENTRY CONDTIONS
                        ;                       COUNTER= # OF CHARACTERS BE RECEIVED
                        ;                       R1     = ADDRESS OF BUFFER FOR NEXT CHARACTER
                        ;
                        ;       EXIT CONDITIONS
                        ;                       RCOUNT = COUNT OF CHARACTERS RECEIVED
                        ;                       RFLAG  = RECEIVE END FLAG ( 1 = NO ERROR, -1 = ERROR)
                        ;                       R1     = INCREMENTED TO NEXT BYTE IN BUFFER.
                        ;
                        ;
                        ;       USED IN TESTS: 42 & 43
                        ;
                        ;*****************************************************************

016776                  BGNSRV  RDATA2
016776                                                                  RDATA2::

016776  105777  163266          TSTB    @RXCSR          ;IS THIS DATA?
017002  100404                  BMI     5$
                                                        ;DATA OR STATUS?
017004  012737  177777  002376  MOV     #-1,RFLAG       ;FLAG FOR ERROR
017012  000412                  BR      20$

017014                  5$:
017014  117721  163252          MOVB    @RDSR,(R1)+     ;SAVE THE DATA.
017020  005237  002500          INC     RCOUNT          ;INCREMENT BYTE COUNT
017024  005337  002326          DEC     COUNTER         ;DECREMENT COUNT
017030  001006                  BNE     30$             ;BR IF NOT DONE.
017032  012737  000001  002376  MOV     #1,RFLAG        ;SET FLAG
017040                  c
017040  042777  000100  163222  BIC     #RXITEN,@RXCSR  ;DISABLE INTERRUPT
017046                  b:

017046                  ENDSRV
017046                                                                  L10024:
017046  000002                                                                  RTI
```

GLOBAL INTERRUPT HANDLING ROUTINES

```
                        ;*****************************************************************
                        ;       XINT -  INTERRUPT SERVICE ROUTINE
                        ;
                        ;       FUNCTION - TRANSMIT INTERRUPT ROUTINE. SET A FLAG WHEN INTERRUPT
                        ;                  GENERATED.  THIS ISR WILL TRANSMIT 4 DATA CHARACTERS AND
                        ;                  END A MESSAGE IN A SPECIFIED MANNER.
                        ;
                        ;       ENTRY CONDTIONS
                        ;                  ABORT = FLAG. SET IF TERMINATE BY AN ABORT IS DESIRED.
                        ;                  START = # OF START CHARACTERS (FLAGS OR SYNCHS) TO
                        ;                          BE SENT.
                        ;
                        ;       EXIT CONDITIONS
                        ;                  TFLAG = FLAG SET WHEN THIS INTERRUPT IS SERVICED
                        ;                  DATA  = # OF DATA CHARACTERS TRANSMITTED
                        ;
                        ;       USED IN TESTS:  6, 8-11, 14
                        ;
                        ;*****************************************************************

017050                  BGNSRV  XINT
017050                                                                  XINT::
017050  012737  000001  002424          MOV     #1,TFLAG        ;SET THE TRANSMIT FLAG
017056  005737  002414                  TST     START           ;SEND START
017062  001410                          BEQ     5$              ;IS THIS DATA OR A START
017064  012777  000400  163204          MOV     #TSOM,@TDSR     ;TRANSMIT A SYNCH/FLAG.
017072  005337  002414                  DEC     START           ;DECREMENT START COUNTER.
017076  005037  002330                  CLR     DATA            ;CLEAR DATA COUNTER
017102  000424                          BR      20$
017104                  5$:
017104  022737  000004  002330          CMP     #4,DATA         ;HAVE WE SENT 4 DATA CHARACTERS
017112  001013                          BNE     10$
017114  005737  002322                  TST     ABORT           ;SEND AN ABORT?
017120  001404                          BEQ     7$
017122  052777  002000  163146          BIS     #TXABO,@TDSR    ;SEND AN ABORT
017130  000411                          BR      20$
017132                  7$:
017132  012777  001021  163136          MOV     #TEOM!21,@TDSR  ;SEND END OF MESSAGE
017140  000405                          BR      20$
017142                  10$:
017142  012777  000041  163126          MOV     #41,@TDSR       ;TRANSMIT DATA.
017150  005237  002330                  INC     DATA            ;INCREMENT DATA
017154                  20$:
017154                  ENDSRV
017154                                                                  L10025:
017154  000002                                                                  RTI

```

```
                        ;*****************************************************************************
                        ;       XDATA - INTERRUPT SERVICE ROUTINE
                        ;
                        ;       FUNCTION - GENERAL PURPOSE TRANSMIT INTERRUPT ROUTINE
                        ;
                        ;       ENTRY CONDTIONS
                        ;                       START = # OF START CHARACTERS (FLAGS OR SYNCHS) TO
                        ;                               BE SENT.
                        ;                       TSTART= TRANSMIT START OF MESSAGE BIT/(OR BITS)
                        ;                       HEADER= # OF HEADER CHARACTERS (8 BIT CHARACTERS) TO
                        ;                               TRANSMIT BEFORE, SETTING THE SELECTED
                        ;                               CHARACTER LENGTH.
                        ;                       IPCR  = IMAGE OF PCR. CHARACTER LENGTH TO SET AFTER
                        ;                               THE HEADER CHARACTERS ARE SENT.
                        ;
                        ;       EXIT CONDITIONS
                        ;                       XMITD = # OF DATA CHARACTERS TRANSMITTED
                        ;                       RCOUNT= 0 (AFTER START OF MESSAGE TRANSMITTED)
                        ;
                        ;       USED IN TESTS: 15-28 & 30-40 (CALLED IN SUBROUTINE $DATA)
                        ;
                        ;*****************************************************************************

017156                  BGNSRV  XDATA
017156                                                                  XDATA::

017156  005737  002414          TST     START           ;ANY STARTS LEFT TO SEND?
017162  001426                  BEQ     10$             ;IF NOT, SKIP.
017164  032737  000001  002434  BIT     #BIT0,TSTART    ;IS THIS SPECIAL START SEQUENCE.
017172  001407                  BEQ     2$              ;IF NOT - SKIP.
                                                        ;* NOTE: CERTAIN USYNRTS ONLY TRANSMIT
                                                        ;* A SPECIAL START SEQUENCE WHEN
                                                        ;* TRANSMIT START AND END OF MESSAGE
                                                        ;* ARE SET BY A BYTE OPERATION.
017174  113777  002434  163104  MOVB    TSTART,@CSR7    ;SEND SPECIAL SEQUENCE START OF MESSAGE.
017202  042737  000002  002434  BIC     #BIT1,TSTART    ;CLEAR END OF MESSAGE IN SPECIAL START
017210  000403                  BR      5$
017212                  2$:
017212  013777  002434  163056  MOV     TSTART,@TDSR    ;SEND START OF MESSAGE.
017220                  5$:
017220  005337  002414          DEC     START           ;DECREMENT COUNTER.
017224  001040                  BNE     20$             ;IF NOT LAST START EXIT.
017226  005037  002476          CLR     XMITD           ;CLEAR TRANSMIT COUNT.
017232  005037  002500          CLR     RCOUNT          ;CLEAR RECEIVER COUNT.
017236  000433                  BR      20$
017240                  10$:
017240  005737  002340          TST     HEADER          ;IS THIS A CONTROL CHARACTER?
017244  001407                  BEQ     15$             ;IF DONE WITH CONTROL CHAR, SET LENGTH
017246  100413                  BMI     16$             ;AFTERWARDS - BR TO TRANSMIT
017250  042777  000400  163020  BIC     #TSOM,@TDSR     ;CLEAR START OF MESSAGE.
017256  005337  002340          DEC     HEADER          ;DECREMENT HEADER COUNT.
017262  000405                  BR      16$             ;
017264                  15$:
017264  005337  002340          DEC     HEADER          ;MAKE HEADER FLAG - NEGATIVE
017270  153777  002342  163006  BISB    IPCR,@PCR       ;SET CHARACTER LENGTH (BOP MODE)
```

GLOBAL INTERRUPT HANDLING ROUTINES

```
     57 017276                                  16$:
     58 017276  112277  162774                        MOVB    (R2)+,@TDSR     ;TRANSMIT A CHARACTER.
     59 017302  005237  002476                        INC     XMITD           ;INCR COUNT OF ACTUALLY SENT.
     60 017306  005303                                DEC     R3              ;DECREMENT COUNTER
     61 017310  001006                                BNE     20$
     62 017312  053777  002422  162756                BIS     TEND,@TDSR      ;TRANSMIT END OF MESSAGE.
     63 017320  042777  000100  162746                BIC     #TXIE,@TXCSR    ;DISABLE TRANSMITTER INTERRUPT.
     64 017326                                  20$:
     65
     66 017326                                  ENDSRV
        017326                                                                  L10026:
        017326  000002                                                                 RTI
     67
```

GLOBAL INTERRUPT HANDLING ROUTINES

```
                        ;*****************************************************************************
                        ;       XDATA2 - INTERRUPT SERVICE ROUTINE
                        ;
                        ;       FUNCTION - HIGH SPEED TRANSMIT INTERRUPT ROUTINE
                        ;
                        ;       ENTRY CONDTIONS
                        ;                       START = # OF START CHARACTERS (FLAGS OR SYNCHS) TO
                        ;                               BE SENT.
                        ;
                        ;       EXIT CONDITIONS
                        ;                       XMITD - # OF DATA CHARACTERS TRANSMITTED
                        ;
                        ;
                        ;       USED IN TESTS: 42,43
                        ;
                        ;*****************************************************************************
                        ;
017330                  BGNSRV  XDATA2
017330                                                                          XDATA2::
017330  005737  002414          TST     START           ;ANY STARTS LEFT TO SEND?
017334  100414                  BMI     20$             ;IF NEGATIVE SEND DATA
017336  001406                  BEQ     10$             ;IF NOT, SKIP.
017340  052777  000400  162730  BIS     #TSOM,@TDSR     ;SEND SYNCH (OR FLAG)
017346                  5$:
017346  005337  002414          DEC     START           ;DECREMENT COUNTER.
017352  000421                  BR      30$
017354                  10$:
017354  005337  002414          DEC     START           ;MAKE THE COUNTER NEGATIVE.
017360  042777  000400  162710  BIC     #TSOM,@TDSR     ;CLEAR START OF MESSAGE
017366                  20$:
017366  112277  162704          MOVB    (R2)+,@TDSR     ;TRANSMIT A CHARACTER.
017372  005237  002476          INC     XMITD           ;INCR COUNT OF ACTUALLY SENT.
017376  005303                  DEC     R3              ;DECREMENT COUNTER
017400  001006                  BNE     30$
017402  052777  001000  162666  BIS     #TEOM,@TDSR     ;TRANSMIT END OF MESSAGE.
017410  042777  000100  162656  BIC     #TXIE,@TXCSR    ;DISABLE TRANSMITTER INTERRUPT.
017416                  30$:

                        ENDSRV
017416                                                                  L10027:
017416  000002                                                                  RTI
```

```
GLOBAL INTERRUPT HANDLING ROUTINES
                        ;*****************************************************************************
                        ;       XDDCMP - INTERRUPT SERVICE ROUTINE
                        ;
                        ;       FUNCTION - DDCMP TRANSMIT INTERRUPT ROUTINE
                        ;
                        ;       ENTRY CONDTIONS
                        ;                       START = # OF START CHARACTERS (FLAGS OR SYNCHS) TO
                        ;                               BE SENT.
                        ;                       HEADER= FLAG WHICH IS SET AFTER THE DDCMP HEADER HAS
                        ;                               BEEN TRANSMITTED
                        ;                       DDCMP2= # OF DATA CHARACTERS IN THE DDCMP DATA MESSAGE
                        ;
                        ;       EXIT CONDITIONS
                        ;                       XMITD = # OF DATA CHARACTERS TRANSMITTED
                        ;                       RCOUNT= 0 (AFTER START OF MESSAGE TRANSMITTED)
                        ;
                        ;
                        ;       USED IN TESTS: 41
                        ;
                        ;*****************************************************************************

017420                  BGNSRV  XDDCMP
017420                                                                          XDDCMP::

017420  005737  002414          TST     START           ;ANY STARTS LEFT TO SEND?
017424  001413                  BEQ     10$             ;IF NOT, SKIP.
017426  012777  000400  162642  MOV     #TSOM,@TDSR     ;SEND START OF MESSAGE.
017434  005337  002414          DEC     START           ;DECREMENT COUNTER.
017440  001034                  BNE     20$             ;
017442  005037  002476          CLR     XMITD           ;CLEAR TRANSMIT COUNT.
017446  005037  002500          CLR     RCOUNT          ;CLEAR RECEIVER COUNT.
017452  000427                  BR      20$
017454                  10$:
017454  042777  001400  162614  BIC     #TEOM!TSOM,@TDSR ;CLEAR START OR END OF MESSAGE.
017462  112277  162610          MOVB    (R2)+,@TDSR     ;TRANSMIT A CHARACTER.
017466  005237  002476          INC     XMITD           ;INCR COUNT OF ACTUALLY SENT.
017472  005303                  DEC     R3              ;DECREMENT COUNTER
017474  001016                  BNE     20$
017476  052777  001000  162572  BIS     #TEOM,@TDSR     ;TRANSMIT END OF MESSAGE.
017504  005737  002340          TST     HEADER          ;IS THIS THE HEADER
017510  001005                  BNE     15$             ;IF NOT, DISABLE THE TRANSMITTER
017512  005237  002340          INC     HEADER          ;SET HEADER FLAG.
017516  012703  000015          MOV     #DDCMP2,R3      ;COUNTER FOR THE MESSAGE
017522  000403                  BR      20$
017524                  15$:
017524  042777  000100  162542  BIC     #TXIE,@TXCSR    ;DISABLE TRANSMITTER INTERRUPT.
017532                  20$:

017532                  ENDSRV
017532                                                                          L10030:
017532  000002                                                                          RTI
50
```

GLOBAL INTERRUPT HANDLING ROUTINES

```
                        ;*****************************************************************************
                        ;       NXM -   INTERRUPT SERVICE ROUTINE
                        ;
                        ;       FUNCTION - NXM INTERRUPT ROUTINE.  THIS ROUTINE IS ASSIGNED
                        ;                  TO VECTOR 4 WHEN ADDRESSING THE DPV FOR THE FIRST
                        ;                  TIME.  IF THIS INTERRUPT IS GENERATED THE DPV IS
                        ;                  INCORRECTLY ADDRESSED.
                        ;
                        ;       ENTRY CONDTIONS
                        ;
                        ;       EXIT CONDITIONS
                        ;                       NXMFLG= FLAG SET WHEN THIS INTERRUPT IS SERVICED.
                        ;
                        ;       USED IN TESTS:  AUTO DROP
                        ;
                        ;*****************************************************************************

017534                  BGNSRV  NXM
017534                                                                          NXM::

017534  012737  000001  002366          MOV     #1,NXMFLG               ;SET FLAG IF MEMORY IS NON-EXISTENT.

017542                  ENDSRV
017542                                                                          L10031:
017542  000002                                                                        RTI
```

DROP UNIT SECTION

```
                                .SBTTL  DROP UNIT SECTION

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

017544                          BGNDU
017544                                                                  L$DU::
                        BRESET                  ;ISSUE LSI-BUS RESET TO CLEAN UP
017544  104433                                                          TRAP    C$RESET
                        PRINTF  #FMDROP,LOGDEV
017546  013746  002354                                                  MOV     LOGDEV,-(SP)
017552  012746  017574                                                  MOV     #FMDROP,-(SP)
017556  012746  000002                                                  MOV     #2,-(SP)
017562  010600                                                          MOV     SP,R0
017564  104417                                                          TRAP    C$PNTF
017566  062706  000006                                                  ADD     #6,SP

017572                          ENDDU
017572                                                                  L10032:
017572  104453                                                          TRAP    C$DU

017574  045  116  045  FMDROP: .ASCIZ  /%N%AUNIT %D2%A DROPPED/
017577  101  125  116
017602  111  124  040
017605  045  104  062
017610  045  101  040
017613  104  122  117
017616  120  120  105
017621  104  000
                                .EVEN
```

DROP UNIT SECTION
1

```
                                .SBTTL          TEST 1 - CSR ADDRESSING
                                ;
                                ;*****************************************************************************
                                ;*                      TEST 1 - DPV-11
                                ;* VERIFY THAT ADDRESSING THE 4 LSI-BUS CSRS DOES NOT CAUSE A NON-
                                ;* EXISTENT MEMORY TRAP.
                                ;*
                                ;* THE DPV IS AN COMMUNICATION DEVICE RESIDING ON A LSI-BUS.
                                ;* COMMUNICATION BETWEEN THE MAIN CPU AND THE DPV IS ACCOMPLISHED
                                ;* THROUGH A SET OF FOUR 16-BIT LSI-BUS CONTROL AND STATUS REGISTERS
                                ;* (CSRS).  THE FOUR REGISTERS ARE ASSIGNED ADDRESSES IN THE I/O PAGE
                                ;* FLOATING ADDRESS SPACE: 76XXX0 - 76XXX6
                                ;*
                                ;* AN ERROR IN THIS TEST COULD MEAN THAT THE DEVICE IS INCORRECTLY
                                ;* CONFIGURED, THAT THE ADDRESS IS WRONG OR THAT THE CRYSTAL CLOCK
                                ;* ON THE DPV IS NOT WORKING.  THE SHIFT REGISTER CLOCK IS NEEDED
                                ;* FOR THE LS164 (E15) IN ORDER TO PROVIDE THE BUS REPLY (BRPLY/L ON
                                ;* PIN AF2).
                                ;*****************************************************************************
 017624                         BGNTST
 017624                                                                  T1::
                                
 017624                                 SETVEC  #4,#LOCATE,#PRIO7 ;SET UP NON -EXISTENT MEMORY TRAP VECTOR.
 017624  012746  000340                                                          MOV     #PRIO7,-(SP)
 017630  012746  017766                                                          MOV     #LOCATE,-(SP)
 017634  012746  000004                                                          MOV     #4,-(SP)
 017640  012746  000003                                                          MOV     #3,-(SP)
 017644  104437                                                                 TRAP    C$SVEC
 017646  062706  000010                                                          ADD     #10,SP
 017652  005037  002366                 CLR     NXMFLG          ;FLAG USED IN THE TRAP ROUTINE.
 017656  005001                         CLR     R1              ;USE REGISTER TO REMEMBER WHICH OF THE
                                                                 ;4 CSRS WE ARE ADDRESSING.
                                
                                ;;*****************************************************************************
                                ; IF ADDRESSING ANY ONE OF THE CSRS RESULTS IN A TRAP TO VECTOR 04, THE TRAP
                                ; WILL REPORT THE ERROR (SEE INTERRUPT ROUTINE 'LOCATE').  OTHERWISE THE
                                ; MEMORY REFERENCE IS UNEVENTFUL AND THE DEVICE IS READY FOR FURTHER TESTS
                                ;;*****************************************************************************
                                
 017660  005777  162404                 TST     @CSR0           ;TEST THE CSR AT 76XXX0
 017664  012701  000002                 MOV     #2,R1           ;SAVE THE OFFSET OF THE NEXT CSR
 017670  005777  162376                 TST     @CSR2           ;TEST THE CSR AT 76XXX2
 017674  012701  000004                 MOV     #4,R1           ;SAVE THE OFFSET OF THE NEXT CSR
 017700  005777  162370                 TST     @CSR4           ;TEST THE CSR AT 76XXX4
 017704  012701  000006                 MOV     #6,R1           ;SAVE THE OFFSET OF THE NEXT CSR
 017710  005777  162362                 TST     @CSR6           ;TEST THE CSR AT 76XXX6
 017714  005737  002366                 TST     NXMFLG          ;WAS THERE A TRAP?
 017720  001416                         BEQ     10$             ;IF NOT - EXIT.
 017722                                 PRINTX  #FMT1           ;SUGGEST THE PROBLEM. (
 017722  012746  020150                                                          MOV     #FMT1,-(SP)
 017726  012746  000001                                                          MOV     #1,-(SP)
 017732  010600                                                                 MOV     SP,R0
 017734  104415                                                                 TRAP    C$PNTX
 017736  062706  000004                                                          ADD     #4,SP
 017742                                 DODU    LOGDEV          ;DROP THE DEVICE
 017742  013700  002354                                                          MOV     LOGDEV,R0
 017746  104451                                                                 TRAP    C$DODU
```

```
TEST 1 - CSR ADDRESSING
     44 017750                          DOCLN                   ;CLEAN UP CODE - FORCE BACK TO INIT.
        017750  104444                                                       TRAP    C$DCLN
     45 017752  005037  002366          CLR     NXMFLG          ;RESTORE THE FLAG.
     46 017756                  10$:
     47 017756                          CLRVEC  #4              ;RETURN VECTOR 04 TO NORMAL STATE
        017756  012700  000004                                               MOV     #4,R0
        017762  104436                                                       TRAP    C$CVEC
     48
     49 017764                  ENDTST
        017764                                                          L10033:
        017764  104401                                                       TRAP    C$ETST
     50
     51
     52 017766                  BGNSRV  LOCATE                  ;INTERRUPT SERVICE ROUTINE
        017766                                                               LOCATE::
     53 017766  005737  002366          TST     NXMFLG          ;HAVE WE HAD AT LEAST 1 PREVIOUS TRAP?
     54 017772  001006                  BNE     10$             ;IF YES, DON'T BOTHER DECLARING ANOTHER
     55                                                         ;DEVICE FATAL ERROR
     56 017774                          ERRDF   9,EMT0          ;NON-EXISTENT DEVICE ERROR
        017774  104455                                                       TRAP    C$ERDF
        017776  000011                                                       .WORD   9
        020000  020040                                                       .WORD   EMT0
        020002  000000                                                       .WORD   0
     57 020004  005237  002366          INC     NXMFLG          ;SET THE FLAG
     58 020010                  10$:
     59 020010                          PRINTX  #FMT0,R1,CSR0(R1) ;PRINT THE CSR THAT DOESN'T RESPOND.
        020010  016146  002270                                               MOV     CSR0(R1),-(SP)
        020014  010146                                                       MOV     R1,-(SP)
        020016  012746  020076                                               MOV     #FMT0,-(SP)
        020022  012746  000003                                               MOV     #3,-(SP)
        020026  010600                                                       MOV     SP,R0
        020030  104415                                                       TRAP    C$PNTX
        020032  062706  000010                                               ADD     #10,SP
     60 020036                  ENDSRV
        020036                                                          L10034:
        020036  000002                                                       RTI
     61
     62 020040     103     123     122  EMT0:   .ASCIZ  /CSR ADDRESSING ERROR - TRAP 4/
        020043     040     101     104
        020046     104     122     105
        020051     123     123     111
        020054     116     107     040
        020057     105     122     122
        020062     117     122     040
        020065     055     040     124
        020070     122     101     120
        020073     040     064     000
     63 020076     045     123     063  FMT0:   .ASCIZ  /%S3%ACSR%D1%A AT %O6%A DOES NOT RESPOND%N/
        020101     045     101     103
        020104     123     122     045
        020107     104     061     045
        020112     101     040     101
        020115     124     040     045
        020120     117     066     045
        020123     101     040     104
        020126     117     105     123
        020131     040     116     117
```

```
TEST 1 - CSR ADDRESSING
        020134      124     040     122
        020137      105     123     120
        020142      117     116     104
        020145      045     116     000
     64 020150      045     101     050  FMT1:    .ASCIZ  /%A(CONFIGURATION ERROR  OR  NO BUS REPLY SIGNAL)%N2/
        020153      103     117     116
        020156      106     111     107
        020161      125     122     101
        020164      124     111     117
        020167      116     040     105
        020172      122     122     117
        020175      122     040     040
        020200      117     122     040
        020203      040     116     117
        020206      040     102     125
        020211      123     040     122
        020214      105     120     114
        020217      131     040     123
        020222      111     107     116
        020225      101     114     051
        020230      045     116     062
        020233      000
     65                                          .EVEN
     66
     67
     68
```

TEST 2 - DPV RESET

```
                                .SBTTL          TEST 2 - DPV RESET

                                ;*******************************************************************************
                                ;*              TEST 2 - DPV-11
                                ;* DPV RESET
                                ;* RESET THE DPV AND ENSURE THAT ALL REGISTERS ARE IN THEIR
                                ;* PROPER INITIALIZATION STATE.  THE RESET IS ASYNCHRONOUS TO ALL
                                ;* DATA SET TIMING AND ANY DATA PORT ACCESSES. THE FOLLOWING
                                ;* WILL BE CHECKED BY THE $RESET SUBROUTINE:
                                ;*      1. ALL BITS IN THE DATA PORT REGISTERS ARE CLEARED.
                                ;*      2. ALL OUTPUT INDICATORS ARE .LEARED.
                                ;*      3. TRANSMIT BUFFER EMPTY (TBE) IS SET
                                ;*
                                ;* SUBTEST 1 - AFTER RESET, CHECK THAT MAINTENANCE MODE AND
                                ;*              TRANSMITTER CAN BE SET. ALSO CHECK THAT TRANSMITTER
                                ;*              BUFFER EMPTY (TBE) IS CLEARED WHEN TDSR IS ACCESSED
                                ;*              WITHOUT SETTING TRANSMITTER ENABLE.
                                ;* SUBTEST 2 - ON THE FIRST PASS ONLY, CHECK THAT A BUS RESET, DOES
                                ;*              A DPV11 RESET.
                                ;*
                                ;* NOTE: DATA MODE, CTS, RR (RECEIVER READY) AND IC (INCOMING CALL)
                                ;*       ARE UNAFFECTED BY A RESET.
                                ;*
                                ;*******************************************************************************
020234                          BGNTST
020234                                                                          T2::
020234                            BGNSUB
020234                                                                          T2.1:
020234  104402                                                                    TRAP    C$BSUB
020236                                  CALL    $RESET          ;RESET THE DPV
020242                                  ESCAPE  TST             ;IF ERROR, EXIT THE TEST
020242  104410                                                                  TRAP    C$ESCAPE
020244  000212                                                                  .WORD   L10035-.
020246  005001                          CLR     R1              ;BITS SHOULD BE CLEAR.
020250  005077  162022                  CLR     @TDSR           ;CLEAR TBE
020254  005777  162014                  TST     @TXCSR          ;IS TBE CLEARED?
020260  001035                          BNE     10$             ;ERROR IF NOT CLEAR
020262  012701  000010                  MOV     #10,R1          ;REMEMBER BITS TO SET.
020266  050177  162002                  BIS     R1,@TXCSR       ;SET THOSE BITS
020272  020177  161776                  CMP     R1,@TXCSR       ;WERE THOSE BITS SET
020276  001026                          BNE     10$
020300  012701  000020                  MOV     #20,R1          ;NEXT BIT TO SET
020304  110177  161764                  MOVB    R1,@TXCSR
020310  020177  161760                  CMP     R1,@TXCSR
020314  001017                          BNE     10$
020316  012701  000030                  MOV     #30,R1
020322  112777  000030  161744          MOVB    #TXENA!MM,@TXCSR ;SET THE ENABLE AND MAINT. MODE.
020330  020177  161740                  CMP     R1,@TXCSR       ;ARE THOSE BITS SET?
020334  001007                          BNE     10$             ;BR IF IN ERROR.
020336  012701  000100                  MOV     #100,R1         ;SET TX INTERRUPT ENABLE.
020342  110177  161726                  MOVB    R1,@TXCSR       ;SET THE INTERRUPT BIT
020346  020177  161722                  CMP     R1,@TXCSR       ;IS THE BIT SET?
020352  001404                          BEQ     20$             ;IF YES - OK.
020354                          10$:
020354                                  ERRDF   10,EMG4,ERRG7
020354  104455                                                                  TRAP    C$ERDF
020356  000012                                                                  .WORD   10
```

```
TEST 2 - DPV RESET
        020360  013430                                                                  .WORD   EMG4
        020362  007052                                                                  .WORD   ERRG7
     51 020364                          20$:
     52 020364                            ENDSUB
        020364                                                                  L10036:
        020364  104403                                                                  TRAP    C$ESUB
     53
     54
     55
     56 020366                          BGNSUB
        020366                                                                  T2.2:
        020366  104402                                                                  TRAP    C$BSUB
     57 020370  022737  000001  002320          CMP     #1,$TARES       ;IS THIS THE FIRST PASS?
     58 020376  001026                          BNE     30$             ;IF NOT - SKIP THIS TEST.
     59 020400                                  BRESET                  ;BUS RESET.
        020400  104433                                                                  TRAP    C$RESET
     60 020402                                  $DELAY  10              ;DELAY 1 MSEC.

                                                                        ;******** MACRO EXPANSION ********
        020402  004737  006464                  JSR     PC,$DLAY        ;CALL DELAY SUBROUTINE
        020406  000010                                  .WORD   10      ;NUMBER OF DELAY LOOPS
                                                                        ;**********************************

     61 020410  005001                          CLR     R1              ;EXPECT 0 IN ALL R/W REGISTERS
     62 020412  105777  161652                  TSTB    @RXCSR          ;IS THE RECEIVE CSR 0?
     63 020416  001012                          BNE     20$             ;BRANCH ON ERROR.
     64 020420  005777  161646                  TST     @RDSR           ;EXPECT READ DATA/STATUS TO BE 0
     65 020424  001007                          BNE     20$             ;BR IF NOT
     66 020426  022777  000004  161640          CMP     #4,@TXCSR       ;EXPECT TBE TO BE SET.
     67 020434  001003                          BNE     20$             ;BR IF NOT
     68 020436  005777  161634                  TST     @TDSR           ;EXPECT XMIT. DATA/STATUS TO BE 0.
     69 020442  001404                          BEQ     30$             ;BRANCH IF OK.
     70 020444                          20$:
     71 020444                                  ERRDF   11,EMG0,ERRG11  ;PRINT ERROR MESSAGE
        020444  104455                                                                  TRAP    C$ERDF
        020446  000013                                                                  .WORD   11
        020450  013246                                                                  .WORD   EMG0
        020452  007452                                                                  .WORD   ERRG11
     72 020454                          30$:
     73 020454                            ENDSUB
        020454                                                                  L10037:
        020454  104403                                                                  TRAP    C$ESUB
     74
     75 020456                          ENDTST
        020456                                                                  L10035:
        020456  104401                                                                  TRAP    C$ETST
     76
```

TEST 2 - DPV RESET
1

TEST 3 - CSR READ/WRITE

```
                                .SBTTL          TEST 3 - CSR READ/WRITE

                                ;*****************************************************************************
                                ;*              TEST 3 - DPV-11
                                ;* WRITE/READ DATA PATTERNS
                                ;* THIS TEST IS INTENDED TO TEST THE READ/WRITE BITS IN THE CSRS. THERE
                                ;* IS NO INTENTION TO CHECK THE USYNR/T; IT IS DESIRED TO ONLY CHECK THE
                                ;* READING AND WRITING OF THE CSRS.  IN ALL THE SUBTESTS THE BITS ARE
                                ;* CHECKED TOGETHER AND INDIVIDUALLY.
                                ;* SUBTEST 1 - RXCSR (LOW BYTE CSR0)
                                ;*             CHECK BITS 0-6
                                ;* SUBTEST 2 - PCR (HIGH BYTE CSR4)
                                ;*             CHECK BITS 0-7
                                ;* SUBTEST 3 - TDSR (LOW BYTE OF CSR6) - TRANSMIT DATA BUFFER
                                ;*             BITS 0-7
                                ;* SUBTEST 4 - TDSR (HIGH BYTE OF CSR6) - TRANSMIT STATUS REGISTER.
                                ;*             BITS 0-3
                                ;* SUBTEST 5 - TDSR  - CHECK BYTE OP SIGNAL FOR USYNRT
                                ;*
                                ;*****************************************************************************
020460                          BGNTST
020460                                                                  T3::
020460                                  CALL    $RESET          ;RESET THE DPV
020464                                  ESCAPE  TST             ;IF ERROR, EXIT THE TEST
020464  104410                                                          TRAP    C$ESCAPE
020466  000520                                                          .WORD   L10040-.

020470                          BGNSUB
020470                                                                  T3.1:
020470  104402                                                          TRAP    C$BSUB
020472  012701  000001                  MOV     #BIT0,R1        ;START ROTATE PATTERN
020476  012702  000007                  MOV     #7,R2           ;COUNTER - WRITE INTO BITS 0-6.
020502                          10$:
020502  150177  161562                  BISB    R1,@RXCSR       ;WRITE BIT.
020506  120177  161556                  CMPB    R1,@RXCSR       ;IS THE BIT WRITTEN?
020512  001022                          BNE     20$             ;IF NOT - REPORT IT.
020514  006101                          ROL     R1              ;ROTATE THE BIT PATTERN.
020516  105077  161546                  CLRB    @RXCSR          ;CLEAR REGISTER
020522  005302                          DEC     R2
020524  001366                          BNE     10$             ;CONTINUE UNTIL DONE.

020526  012701  000137                  MOV     #137,R1         ;WRITE ALL BITS EXCEPT MODEM CONTROL INT.
                                                                ;MODEM CONTROL NOT WRITTEN BECAUSE WE DON'T
                                                                ;WANT TO ACTUALLY GENERATE AN INTERRUPT.
020532  110177  161532                  MOVB    R1,@RXCSR       ;WRITE BITS.
020536  120177  161526                  CMPB    R1,@RXCSR       ;IS THE PATTERN WRITTEN?
020542  001006                          BNE     20$             ;IF NOT REPORT IT
020544  005001                          CLR     R1              ;REMEMBER DATA PATTERN
020546  105077  161516                  CLRB    @RXCSR          ;CLEAR THOSE BITS.
020552  105777  161512                  TSTB    @RXCSR          ;ARE THOSE BITS CLEARED?
020556  001404                          BEQ     30$             ;IF YES, OK.
020560                          20$:
020560                                  ERRDF   12,EMG4,ERRG4
020560  104455                                                          TRAP    C$ERDF
020562  000014                                                          .WORD   12
020564  013430                                                          .WORD   EMG4
020566  006752                                                          .WORD   ERRG4
```

```
TEST 3 - CSR READ/WRITE
     49 020570                          30$:
     50 020570  105077  161474                CLRB    @RXCSR          ;CLEAR THE REGISTER
     51
     52 020574                          ENDSUB
        020574                                                                  L10041:
        020574  104403                                                                 TRAP    C$ESUB
     53
     54
     55 020576                          BGNSUB
        020576                                                                  T3.2:
        020576  104402                                                                 TRAP    C$BSUB
     56 020600  012701  000377                MOV     #377,R1         ;WRITE DATA PATTERN
     57 020604  110177  161474                MOVB    R1,@PCR         ;WRITE THE PATTERN.
     58 020610  120177  161470                CMPB    R1,@PCR         ;IS THE PATTERN WRITTEN?
     59 020614  001025                        BNE     20$             ;IF NOT REPORT IT
     60 020616  005001                        CLR     R1              ;REMEMBER THE DATA PATTERN
     61 020620  105077  161460                CLRB    @PCR            ;CLEAR THOSE BITS
     62 020624  105777  161454                TSTB    @PCR            ;WERE THE BITS CLEARED?
     63 020630  001017                        BNE     20$             ;IF NOT - REPORT IT
     64 020632  012701  000001                MOV     #BIT0,R1        ;START ROTATE PATTERN
     65 020636  012702  000006                MOV     #6,R2           ;ROTATE THE BIT 4 TIMES
     66 020642                          10$:
     67 020642  150177  161436                BISB    R1,@PCR         ;WRITE PATTERN
     68 020646  120177  161432                CMPB    R1,@PCR         ;IS THE PATTERN WRITTEN?
     69 020652  001006                        BNE     20$             ;IF NOT - REPORT IT.
     70 020654  006101                        ROL     R1              ;ROTATE THE PATTERN
     71 020656  105077  161422                CLRB    @PCR            ;CLEAR THE PCR.
     72 020662  005302                        DEC     R2
     73 020664  001366                        BNE     10$             ;CONTINUE UNTIL DONE.
     74 020666  000404                        BR      30$             ;EXIT - WHEN DONE
     75 020670                          20$:
     76 020670                                ERRDF   13,EMG4,ERRG8
        020670  104455                                                                 TRAP    C$ERDF
        020672  000015                                                                 .WORD   13
        020674  013430                                                                 .WORD   EMG4
        020676  007152                                                                 .WORD   ERRG8
     77 020700                          30$:
     78 020700  105077  161400                CLRB    @PCR            ;CLEAR THE PCR
     79
     80 020704                          ENDSUB
        020704                                                                  L10042:
        020704  104403                                                                 TRAP    C$ESUB
     81
     82 020706                          BGNSUB
        020706                                                                  T3.3:
        020706  104402                                                                 TRAP    C$BSUB
     83
     84 020710  012701  000377                MOV     #377,R1         ;WRITE DATA PATTERN
     85 020714  110177  161356                MOVB    R1,@TDSR        ;WRITE THE PATTERN.
     86 020720  120177  161352                CMPB    R1,@TDSR        ;IS THE PATTERN WRITTEN?
     87 020724  001025                        BNE     20$             ;IF NOT REPORT IT
     88 020726  005001                        CLR     R1              ;REMEMBER DATA PATTERN
     89 020730  105077  161342                CLRB    @TDSR           ;CLEAR THOSE BITS
     90 020734  105777  161336                TSTB    @TDSR           ;IS THE DATA CLEAR?
     91 020740  001017                        BNE     20$             ;IF NOT - REPORT IT.
     92 020742  012701  000001                MOV     #BIT0,R1        ;START ROTATE PATTERN
     93 020746  012702  000006                MOV     #6,R2           ;ROTATE THE BIT 4 TIMES
```

```
TEST 3 - CSR READ/WRITE
     94 020752                          10$:
     95 020752  150177  161320                BISB    R1,@TDSR        ;WRITE PATTERN
     96 020756  120177  161314                CMPB    R1,@TDSR        ;IS THE PATTERN WRITTEN?
     97 020762  001006                         BNE     20$             ;IF NOT - REPORT IT.
     98 020764  105077  161306                CLRB    @TDSR           ;CLEAR THE DATA.
     99 020770  006101                         ROL     R1              ;ROTATE THE PATTERN
    100 020772  005302                         DEC     R2
    101 020774  001366                         BNE     10$             ;CONTINUE UNTIL DONE.
    102 020776  000404                         BR      30$             ;EXIT - WHEN DONE
    103 021000                          20$:
    104 021000                                 ERRDF   14,EMG4,ERRG9
        021000  104455                                                                 TRAP    C$ERDF
        021002  000016                                                                 .WORD   14
        021004  013430                                                                 .WORD   EMG4
        021006  007252                                                                 .WORD   ERRG9
    105 021010                          30$:
    106 021010  105077  161262                CLRB    @TDSR           ;CLEAR THE TDSR
    107
    108
    109 021014                           ENDSUB
        021014                                                                 L10043:
        021014  104403                                                                 TRAP    C$ESUB
    110
    111 021016                           BGNSUB
        021016                                                                 T3.4:
        021016  104402                                                                 TRAP    C$BSUB
    112 021020  012701  000017                MOV     #17,R1          ;WRITE DATA PATTERN
    113 021024  110177  161256                MOVB    R1,@CSR7        ;WRITE THE PATTERN.
    114 021030  120177  161252                CMPB    R1,@CSR7        ;IS THE PATTERN WRITTEN?
    115 021034  001025                         BNE     20$             ;IF NOT REPORT IT
    116 021036  005001                         CLR     R1              ;REMEMBER DATA PATTERN.
    117 021040  105077  161242                CLRB    @CSR7           ;CLEAR THOSE BITS
    118 021044  105777  161236                TSTB    @CSR7           ;ARE THE STATUS BITS CLEAR?
    119 021050  001017                         BNE     20$             ;IF NOT - REPORT IT.
    120 021052  012701  000001                MOV     #BIT0,R1        ;START ROTATE PATTERN
    121 021056  012702  000003                MOV     #3,R2           ;ROTATE THE BIT 4 TIMES
    122 021062                          10$:
    123 021062  150177  161220                BISB    R1,@CSR7        ;WRITE PATTERN
    124 021066  120177  161214                CMPB    R1,@CSR7        ;IS THE PATTERN WRITTEN?
    125 021072  001006                         BNE     20$             ;IF NOT - REPORT IT.
    126 021074  105077  161206                CLRB    @CSR7           ;CLEAR STATUS BITS.
    127 021100  006101                         ROL     R1              ;ROTATE THE PATTERN
    128 021102  005302                         DEC     R2
    129 021104  001366                         BNE     10$             ;CONTINUE UNTIL DONE.
    130 021106  000404                         BR      30$             ;EXIT - WHEN DONE
    131 021110                          20$:
    132 021110                                 ERRDF   15,EMG4,ERRG10
        021110  104455                                                                 TRAP    C$ERDF
        021112  000017                                                                 .WORD   15
        021114  013430                                                                 .WORD   EMG4
        021116  007352                                                                 .WORD   ERRG10
    133 021120                          30$:
    134 021120  105077  161162                CLRB    @CSR7           ;CLEAR THE XMIT STATUS REG.
    135
    136 021124                           ENDSUB
        021124                                                                 L10044:
        021124  104403                                                                 TRAP    C$ESUB
```

```
TEST 3 - CSR READ/WRITE
    137
    138 021126                          BGNSUB
        021126                                                                  T3.5:
        021126  104402                                                                 TRAP    C$BSUB
    139 021130  012777  007777  161140          MOV     #7777,@TDSR     ;WRITE TO TDSR
    140 021136  105077  161144                  CLRB    @CSR7           ;CLEAR ONLY THE HIGH BYTE.
    141 021142  105777  161130                  TSTB    @CSR6           ;SEE IF THE LOW BYTE WAS ALSO CLEARED
    142 021146  001016                          BNE     10$             ;IF NOT, BYTE OP IS OK.
    143 021150  012701  000377                  MOV     #377,R1         ;DATA FOR ERROR PRINT OUT.
    144 021154                                  ERRDF   16,EMG4,ERRG9   ;PRINT ERROR
        021154  104455                                                                  TRAP    C$ERDF
        021156  000020                                                                  .WORD   16
        021160  013430                                                                  .WORD   EMG4
        021162  007252                                                                  .WORD   ERRG9
    145 021164                                  PRINTX  #FMG30          ;ALSO WARN THAT BYTE OP MAY BE STUCK LOW.
        021164  012746  013170                                                         MOV     #FMG30,-(SP)
        021170  012746  000001                                                         MOV     #1,-(SP)
        021174  010600                                                                 MOV     SP,R0
        021176  104415                                                                 TRAP    C$PNTX
        021200  062706  000004                                                         ADD     #4,SP
    146 021204                          10$:
    147
    148 021204                            ENDSUB
        021204                                                                  L10045:
        021204  104403                                                                 TRAP    C$ESUB
    149
    150 021206                          ENDTST
        021206                                                                  L10040:
        021206  104401                                                                 TRAP    C$ETST
    151
    152
    153
```

TEST 4 - TRANSMIT ENABLE

```
                                .SBTTL          TEST 4 - TRANSMIT ENABLE

                                ;*******************************************************************************
                                ;*              TEST 4 - DMR-11
                                ;* TRANSMIT ENABLE/ TRANSMIT ACTIVE
                                ;* AFTER A DEVICE RESET, SET TRANSMIT START OF MESSAGE (TSOM).  ENSURE
                                ;* THAT TRANSMIT ACTIVE (TXACT) IS SET.
                                ;*
                                ;* TXACT IS USED TO INDICATE THE CURRENT STATE OF THE TRANSMITTER
                                ;* DATA PATH.  THIS BIT WILL BE ASSERTED WHEN BOTH THE TRANSMITTER IS
                                ;* ENABLED AND TSOM ARE INTERNALLY SYNCHRONIZED.  TXACT WILL BE CLEARED
                                ;* UPON RESET OR WHEN THE TRANSMITTER ENTERS THE IDLE STATE.
                                ;*
                                ;*******************************************************************************
021210                          BGNTST
021210                                                                          T4::

                                  BGNSUB
021210                                                                          T4.1:
021210  104402                                                                  TRAP    C$BSUB
021212                                  CALL    $RESET          ;RESET THE DPV
021216                                  ESCAPE  TST             ;IF ERROR, EXIT THE TEST
021216  104410                                                                  TRAP    C$ESCAPE
021220  000330                                                                  .WORD   L10046-.
021222  005737  002310                  TST     TURN            ;TURNAROUND?
021226  001003                          BNE     5$              ;BR IF EXTERNAL.
021230  052777  000010  161036          BIS     #MM,@TXCSR      ;SET MAINTENANCE MODE.
021236                          5$:
021236  052777  000020  161030          BIS     #TXENA,@TXCSR   ;ENABLE THE TRANSMITTER.
021244  052777  000400  161024          BIS     #TSOM,@TDSR     ;TRANSMIT START OF MESSAGE.
021252                                  WAIT    TBE             ;WAIT FOR TBE TO BE SET.
                                                                ;******** MACRO EXPANSION ********
021252  004737  003724                  JSR     PC,$WAIT        ;CALL WAIT ROUTINE -
021256  000004                          .WORD   TBE             ;WAIT FOR TBE TO BE SET
021260  002274                          .WORD   TXCSR           ;IN TRANSMITTER  CSR.
                                                                ;**********************************

021262                                  ESCAPE  TST             ;IF ERROR, BRANCH TO END OF TEST.
021262  104410                                                                  TRAP    C$ESCAPE
021264  000264                                                                  .WORD   L10046-.
021266  032777  000002  161000          BIT     #TXACT,@TXCSR   ;IS THE TRANSMITTER ACTIVE?
021274  001011                          BNE     10$             ;IF YES - OK.
021276  017701  160772                  MOV     @TXCSR,R1       ;SAVE THE TRANSMIT STATUS
021302  052701  000020                  BIS     #TXENA,R1       ;EXPECT TXENA TO BE SET.
021306                                  ERRDF   17,EMG5,ERRG7
021306  104455                                                                  TRAP    C$ERDF
021310  000021                                                                  .WORD   17
021312  013455                                                                  .WORD   EMG5
021314  007052                                                                  .WORD   ERRG7
021316  000425                          BR      20$             ;SKIP THE REST OF THE SUBTEST.

021320                          10$:
021320  005077  160752                  CLR     @TDSR           ;CLEAR TSOM
021324  042777  000020  160742          BIC     #TXENA,@TXCSR   ;DISABLE THE TRANSMITTER
021332                                  WAIT    TBE             ;WAIT FOR TBE TO BE SET.
```

```
                                                        ;******** MACRO EXPANSION ********
        021332  004737  003724                  JSR     PC,$WAIT        ;CALL WAIT ROUTINE -
        021336  000004                          .WORD   TBE             ;WAIT FOR TBE TO BE SET
        021340  002274                          .WORD   TXCSR           ;IN TRANSMITTER  CSR.
                                                        ;**********************************

    39  021342                                  ESCAPE  TST             ;IF ERROR, BRANCH TO END OF TEST.
        021342  104410                                                                  TRAP    C$ESCAPE
        021344  000204                                                                  .WORD   L10046-.
    40  021346  032777  000002  160720          BIT     #TXACT,@TXCSR   ;IS THE TRANSMIITER INACTIVE?
    41  021354  001406                          BEQ     20$             ;IF YES - OK.
    42  021356  012701  000004                  MOV     #TBE,R1         ;EXPECT ONLY TBE TO BE SET.
    43  021362                                  ERRDF   18,EMG6,ERRG7
        021362  104455                                                                  TRAP    C$ERDF
        021364  000022                                                                  .WORD   18
        021366  013510                                                                  .WORD   EMG6
        021370  007052                                                                  .WORD   ERRG7
    44
    45  021372                          20$:
    46  021372                                  ESCAPE TST              ;IF ERROR, BRANCH TO END OF TEST
        021372  104410                                                                  TRAP    C$ESCAPE
        021374  000154                                                                  .WORD   L10046-.
    47
    48  021376                            ENDSUB
        021376                                                                  L10047:
        021376  104403                                                                 TRAP    C$ESUB
    49
    50
    51  021400                            BGNSUB
        021400                                                                  T4.2:
        021400  104402                                                                 TRAP    C$BSUB
    52  021402                                  CALL    $RESET          ;RESET THE DPV
    53  021406                                  ESCAPE  TST             ;IF ERROR, EXIT THE TEST
        021406  104410                                                                  TRAP    C$ESCAPE
        021410  000140                                                                  .WORD   L10046-.
    54  021412  005737  002310                  TST     TURN            ;TURNAROUND?
    55  021416  001003                          BNE     5$              ;BR IF EXTERNAL.
    56  021420  052777  000010  160646          BIS     #MM,@TXCSR      ;SET MAINTENANCE MODE.
    57  021426                          5$:
    58  021426  052777  000020  160640          BIS     #TXENA,@TXCSR   ;ENABLE THE TRANSMITTER.
    59  021434  052777  000400  160634          BIS     #TSOM,@TDSR     ;TRANSMIT START OF MESSAGE.
    60  021442                                  WAIT    TBE             ;WAIT FOR TBE TO BE SET.

                                                        ;******** MACRO EXPANSION ********
        021442  004737  003724                  JSR     PC,$WAIT        ;CALL WAIT ROUTINE -
        021446  000004                          .WORD   TBE             ;WAIT FOR TBE TO BE SET
        021450  002274                          .WORD   TXCSR           ;IN TRANSMITTER  CSR.
                                                        ;**********************************

    61  021452                                  ESCAPE  TST             ;IF ERROR, BRANCH TO END OF TEST.
        021452  104410                                                                  TRAP    C$ESCAPE
        021454  000074                                                                  .WORD   L10046-.
    62  021456  032777  000002  160610          BIT     #TXACT,@TXCSR   ;IS THE TRANSMITTER ACTIVE?
    63  021464  001010                          BNE     10$             ;IF YES - OK.
    64  021466  017701  160602                  MOV     @TXCSR,R1       ;SAVE THE TRANSMIT STATUS
    65  021472  052701  000020                  BIS     #TXENA,R1       ;EXPECT TXENA TO BE SET.
    66  021476                                  ERRDF   19,EMG5,ERRG7
```

TEST 4 - TRANSMIT ENABLE

```
        021476  104455                                                          TRAP    C$ERDF
        021500  000023                                                          .WORD   19
        021502  013455                                                          .WORD   EMG5
        021504  007052                                                          .WORD   ERRG7
    67
    68 021506                           10$:
    69 021506                                   CALL    $RESET          ;RESET THE DPV
    70 021512                                   ESCAPE  TST             ;IF ERROR, EXIT THE TEST
        021512  104410                                                          TRAP    C$ESCAPE
        021514  000034                                                          .WORD   L10046-.
    71 021516  032777  000002  160550           BIT     #TXACT,@TXCSR   ;IS THE TRANSMIITER INACTIVE?
    72 021524  001406                           BEQ     20$             ;IF YES - OK.
    73 021526  012701  000004                   MOV     #TBE,R1         ;EXPECT ONLY TBE TO BE SET.
    74 021532                                   ERRDF   20,EMG6,ERRG7
        021532  104455                                                          TRAP    C$ERDF
        021534  000024                                                          .WORD   20
        021536  013510                                                          .WORD   EMG6
        021540  007052                                                          .WORD   ERRG7
    75
    76 021542                           20$:
    77 021542                                   ESCAPE TST              ;IF ERROR, BRANCH TO END OF TEST
        021542  104410                                                          TRAP    C$ESCAPE
        021544  000004                                                          .WORD   L10046-.
    78
    79 021546                             ENDSUB
        021546                                                                  L10050:
        021546  104403                                                          TRAP    C$ESUB
    80
    81
    82 021550                           ENDTST
        021550                                                                  L10046:
        021550  104401                                                          TRAP    C$ETST
    83
    84
    85
```

```
                        .SBTTL          TEST 5 - TRANSMIT BUFFER EMPTY

                        ;*****************************************************************
                        ;*              TEST 5 - DPV-11
                        ;* TRANSMIT BUFFER EMPTY
                        ;* VERIFY THAT TBE (TRANSMIT BUFFER EMPTY) IS ASSERTED WHENEVER
                        ;* THE DEVICE IS RESET OR WHENEVER THE TDSR IS AVAILABLE FOR DATA.
                        ;* TBE IS CLEARED AFTER WRITING TO THE TDSR.
                        ;*
                        ;*****************************************************************

021552                  BGNTST
021552                                                                  T5::

                          BGNSUB
021552                                                                  T5.1:
021552  104402                                                                  TRAP    C$BSUB
                              CALL    $RESET          ;RESET THE DPV
                              ESCAPE  TST             ;IF ERROR, EXIT THE TEST
021560                                                                  TRAP    C$ESCAPE
021562  000220                                                          .WORD   L10051-.
                              CLR     @TDSR           ;WRITE TO THE TDSR.
                              DELAY   5               ;DELAY 500 MICROSECONDS.  THIS WILL
021570  012727  000005                                                  MOV     #5,(PC)+
021574  000000                                                          .WORD   0
021576  013727  002116                                                  MOV     L$DLY,(PC)+
021602  000000                                                          .WORD   0
021604  005367  177772                                                  DEC     -6(PC)
021610  001375                                                          BNE     .-4
021612  005367  177756                                                  DEC     -22(PC)
021616  001367                                                          BNE     .-20
                                                ;US TO ENSURE THAT TBE IS NOT
                                                ;REASSERTED.  BECAUSE THE TRANSMITTER
                                                ;IS IDLE, TBE SHOULD STAY LOW.
021620  032777  000004  160446      BIT     #TBE,@TXCSR     ;IS TBE CLEARED?
021626  001410                      BEQ     10$             ;IF YES - OK
021630  017701  160442              MOV     @TDSR,R1        ;SAVE THE TRANSMIT DATA/STATUS REG.
021634  042701  000004              BIC     #TBE,R1         ;PUT EXPECTED RESULT IN R1 FOR MSG.
                              ERRDF   21,EMG7,ERRG7
021640                                                                  TRAP    C$ERDF
021642  000025                                                          .WORD   21
021644  013545                                                          .WORD   EMG7
021646  007052                                                          .WORD   ERRG7
                        10$:
                          ENDSUB
021650                                                          L10052:
021650  104403                                                          TRAP    C$ESUB

                          BGNSUB
021652                                                                  T5.2:
021652  104402                                                                  TRAP    C$BSUB
                              CALL    $RESET          ;RESET THE DPV
                              ESCAPE  TST             ;IF ERROR, EXIT THE TEST
021660                                                                  TRAP    C$ESCAPE
021662  000120                                                          .WORD   L10051-.
021664  005737  002310              TST     TURN            ;TURNAROUND?
```

```
TEST 5 - TRANSMIT BUFFER EMPTY
     35 021670  001003                          BNE     1$                ;BR IF EXTERNAL.
     36 021672  052777  000010  160374          BIS     #MM,@TXCSR        ;SET MAINTENANCE MODE.
     37 021700                          1$:
     38
     39 021700  052777  000020  160366          BIS     #TXENA,@TXCSR     ;ENABLE THE TRANSMITTER.
     40 021706  012777  000400  160362          MOV     #TSOM,@TDSR       ;TRANSMIT START OF MESSAGE.
     41 021714                                  WAIT    TBE               ;WAIT FOR TBE TO BE SET.

                                                                          ;******** MACRO EXPANSION ********
        021714  004737  003724                  JSR     PC,$WAIT          ;CALL WAIT ROUTINE -
        021720  000004                                  .WORD   TBE       ;WAIT FOR TBE TO BE SET
        021722  002274                                  .WORD   TXCSR     ;IN TRANSMITTER  CSR.
                                                                          ;**********************************

     42 021724                                  ESCAPE  TST               ;IF ERROR, BRANCH TO END OF TEST.
        021724  104410                                                                    TRAP    C$ESCAPE
        021726  000054                                                                    .WORD   L10051-.
     43
     44 021730  012777  000014  160340          MOV     #14,@TDSR         ;TRANSMIT 1ST CHARACTER.
     45 021736                                  WAIT    TBE               ;WAIT FOR TBE TO BE SET.

                                                                          ;******** MACRO EXPANSION ********
        021736  004737  003724                  JSR     PC,$WAIT          ;CALL WAIT ROUTINE -
        021742  000004                                  .WORD   TBE       ;WAIT FOR TBE TO BE SET
        021744  002274                                  .WORD   TXCSR     ;IN TRANSMITTER  CSR.
                                                                          ;**********************************

     46 021746                                  ESCAPE  TST               ;IF ERROR, BRANCH TO END OF TEST.
        021746  104410                                                                    TRAP    C$ESCAPE
        021750  000032                                                                    .WORD   L10051-.
     47 021752  012701  001000                  MOV     #1000,R1          ;SET UP COUNTER
     48 021756                          5$:
     49 021756  005777  160314                  TST     @TDSR             ;CHECK FOR TRANSMIT ERROR.
     50 021762  100406                          BMI     10$               ;WHEN SET OK.
     51 021764  005301                          DEC     R1                ;DECREMENT COUNTER.
     52 021766  001373                          BNE     5$                ;CONTINUE UNTIL COUNTER 0
     53 021770                                  ERRDF   22,EMG8,ERRG2
        021770  104455                                                                   TRAP    C$ERDF
        021772  000026                                                                   .WORD   22
        021774  013563                                                                   .WORD   EMG8
        021776  006560                                                                   .WORD   ERRG2
     54 022000                          10$:
     55 022000                            ENDSUB
        022000                                                                  L10053:
        022000  104403                                                                   TRAP    C$ESUB
     56
     57
     58 022002                          ENDTST
        022002                                                                  L10051:
        022002  104401                                                                   TRAP    C$ETST
     59
     60
     61
```

```
TEST 6 - TRANSMIT INTERRUPT
                                .SBTTL          TEST 6 - TRANSMIT INTERRUPT

                                ;*****************************************************************
                                ;*              TEST 6 - DPV-11
                                ;* TRANSMIT INTERRUPT
                                ;* VERIFY THAT A TRANSMIT INTERRUPT IS RECEIVED WHEN TRANSMIT
                                ;* BUFFER EMPTY (TBE) IS ASSERTED.
                                ;*
                                ;*****************************************************************
022004                          BGNTST
022004                                                                          T6::

022004                                  CALL    $RESET          ;RESET THE DPV
022010                                  ESCAPE  TST             ;IF ERROR, EXIT THE TEST
022010  104410                                                                  TRAP    C$ESCAPE
022012  000146                                                                  .WORD   L10054-.
022014  005037  002424                  CLR     TFLAG           ;CLEAR THE FLAG USED IN THE INTERRUPT ROUTINE.

022020                                  SETVEC  XMTVEC,#XINT,#PRI04
022020  012746  000200                                                          MOV     #PRI04,-(SP)
022024  012746  017050                                                          MOV     #XINT,-(SP)
022030  013746  002266                                                          MOV     XMTVEC,-(SP)
022034  012746  000003                                                          MOV     #3,-(SP)
022040  104437                                                                  TRAP    C$SVEC
022042  062706  000010                                                          ADD     #10,SP
022046                                  SETPRI  #PRI00          ;SET PROCESSOR PRIORITY.  FOR LSI 11/03
022046  012700  000000                                                          MOV     #PRI00,R0
022052  104441                                                                  TRAP    C$SPRI
                                                                ;THIS WILL ENABLE INTERRUPTS.  FOR 11/23
                                                                ;THIS WILL ALLOW ACKNOWLEDGMENT OF INTERRUPTS
                                                                ;LEVEL 4-7.
                                                                ;SET UP INTERRUPT VECTOR

022054  052777  000120  160212            BIS     #TXENA!TXIE,@TXCSR ;SET THE INTERRUPT ENABLE AND ENABLE
                                                                   ;THE TRANSMITTER.
022062  005000                          CLR     R0              ;TIMER FOR LOOP
022064                          10$:
022064  005737  002424                  TST     TFLAG           ;WAS THE INTERRUPT RECEIVED?
022070  001006                          BNE     20$             ;IF YES - OK.
022072  005300                          DEC     R0              ;DECREMENT TIMER.
022074  001373                          BNE     10$             ;KEEP CHECKING UNTIL THE TIMER EXPIRES.
022076                                  ERRDF   23,EMG9.ERRG2   ;ERROR MESSAGE XMIT NOT RECEIVED.
022076  104455                                                                  TRAP    C$ERDF
022100  000027                                                                  .WORD   23
022102  013577                                                                  .WORD   EMG9
022104  006560                                                                  .WORD   ERRG2
022106                          20$:
022106  005037  002424                  CLR     TFLAG           ;CLEAR THE FLAG
022112  012777  000001  160154          MOV     #RESET,@TXCSR   ;RESET THE DPV
022120                                  $DELAY  1               ;WAIT FOR 100 MICROSECONDS.

                                                                ;******** MACRO EXPANSION ********
022120  004737  006464                  JSR     PC,$DLAY        ;CALL DELAY SUBROUTINE
022124  000001                                  .WORD   1       ;NUMBER OF DELAY LOOPS
                                                                ;**********************************
```

TEST 6 - TRANSMIT INTERRUPT

```
 38 022126  005737  002336                TST     FLAG            ;WAS AN INTERRUPT RECEIVED
 39 022132  001404                        BEQ     30$             ;IF NOT - OK. (RESET SHOULD CLEAR INT ENABLE)
 40 022134                                ERRDF   24,EMG10,ERRG2  ;ERROR MESSAGE - TRANMSIT INT RECEIVED
    022134  104455                                                          TRAP    C$ERDF
    022136  000030                                                          .WORD   24
    022140  013633                                                          .WORD   EMG10
    022142  006560                                                          .WORD   ERRG2
 41 022144                          30$:
 42 022144                                SETPRI  #PRI07          ;SET PROCESSOR PRIORITY TO 7 (FOR
    022144  012700  000340                                                  MOV     #PRI07,R0
    022150  104441                                                          TRAP    C$SPRI
 43                                                              ;LSI 11/03 THIS WILL DISABLE INTERRUPTS)
 44 022152                                CLRVEC  XMTVEC          ;RESTORE THE XMIT INTERRUPT VECTOR
    022152  013700  002266                                                  MOV     XMTVEC,R0
    022156  104436                                                          TRAP    C$CVEC
 45
 46 022160                          ENDTST
    022160                                                                L10054:
    022160  104401                                                          TRAP    C$ETST
 47
 48
 49
 50
```

TEST 7 - RECEIVER ENABLE

```
                                .SBTTL          TEST 7 - RECEIVER ENABLE

                                ;*************************************************************************
                                ;*              TEST 7 - DPV-11
                                ;* RECEIVER ENABLE, RECEIVER ACTIVE AND RECEIVER DATA READY
                                ;*              MODE: BCP, 8 BIT CHARACTERS, MAINTENANCE MODE LOOPBACK
                                ;* ENABLE THE RECEIVER. AFTER TRANSMITTING A CHARACTER WAIT FOR
                                ;* RECEIVER DATA AVAILABLE AND CHECK THAT THE RECEIVER IS ACTIVE.
                                ;* AFTER CLEARING RECEIVER ENABLE, ENSURE THAT THE RECEIVER IS INACTIVE.
                                ;*
                                ;* RECEIVER ENABLE - CONTROLS THE OPERATION OF THE RECEIVER DATA PATH (RDP)
                                ;* RECEIVER ACTIVE - THIS OUTPUT IS ASSERTED WHEN THE RDP PRESENTS THE 1ST
                                ;*                   DATA CHARACTER OF A MESSAGE TO THE USYNRT.  IT REMAINS
                                ;*                   ASSERTED UNTIL THE RDP ENTERS THE IDLE STATE..
                                ;* RECEIVE DATA    - THIS OUTPUT IS SET WHEN THE RDP HAS ASSEMBLED A DATA
                                ;*                   CHARACTER THAT IS READY TO BE PRESENTED.
                                ;*************************************************************************
022162                          BGNTST
022162                                                                  T7::

022162                                  CALL    $RESET          ;RESET THE DPV
022166                                  ESCAPE  TST             ;IF ERROR, EXIT THE TEST
022166  104410                                                                  TRAP    C$ESCAPE
022170  000222                                                                  .WORD   L10055-.
022172  012777  040252  160072          MOV     #40252,@PCSAR   ;SET BCP MODE AND SYNCH CHARACTER.
022200  012777  000020  160062          MOV     #RXENA,@RXCSR   ;ENABLE THE RECEIVER.
022206  012777  000030  160060          MOV     #TXENA!MM,@TXCSR ;ENABLE THE TRANSMITTER
                                                                ;SELECT THE MAINTENANCE LOOFBACK.
022214  052777  000400  160054          BIS     #TSOM,@TDSR     ;TRANSMIT START OF MESSAGE
022222                                  WAIT    TBE             ;WAIT FOR TBE TO BE SET.
                                                                ;******** MACRO EXPANSION ********
022222  004737  003724                  JSR     PC,$WAIT        ;CALL WAIT ROUTINE -
022226  000004                          .WORD   TBE             ;WAIT FOR TBE TO BE SET
022230  002274                          .WORD   TXCSR           ;IN TRANSMITTER  CSR.
                                                                ;************************************

022232                                  ESCAPE  TST             ;IF ERROR, BRANCH TO END OF TEST.
022232  104410                                                                  TRAP    C$ESCAPE
022234  000156                                                                  .WORD   L10055-.
022236  032777  004200  160024          BIT     #RXACT!RDATRY,@RXCSR ;CHECK RECEIVER ACTIVE AND DATA READY.
022244  001056                          BNE     20$             ;IF SET, REPORT ERROR.
022246  052777  000400  160022          BIS     #TSOM,@TDSR     ;RETRANSMIT START OF MESSAGE.
022254                                  WAIT    TBE             ;WAIT FOR TBE TO BE SET.

                                                                ;******** MACRO EXPANSION ********
022254  004737  003724                  JSR     PC,$WAIT        ;CALL WAIT ROUTINE -
022260  000004                          .WORD   TBE             ;WAIT FOR TBE TO BE SET
022262  002274                          .WORD   TXCSR           ;IN TRANSMITTER  CSR.
                                                                ;************************************

022264                                  ESCAPE  TST             ;IF ERROR, BRANCH TO END OF TEST.
022264  104410                                                                  TRAP    C$ESCAPE
022266  000124                                                                  .WORD   L10055-.
022270  032777  004200  157772          BIT     #RXACT!RDATRY,@RXCSR ;CHECK RECEIVER ACTIVE AND DATA READY.
022276  001041                          BNE     20$             ;IF SET, REPORT ERROR.
022300  012777  000123  157770          MOV     #123,@TDSR      ;TRANSMIT THE FIRST DATA CHARACTER.
```

```
TEST 7 - RECEIVER ENABLE
     37 022306                                  WAIT    RDATRY          ;WAIT FOR RECEIVE DATA.

                                                                        ;******** MACRO EXPANSION ********
        022306  004737  003724                  JSR     PC,$WAIT        ;CALL WAIT ROUTINE -
        022312  000200                          .WORD   RDATRY          ;WAIT FOR BIT TO BE SET
        022314  002270                          .WORD   RXCSR           ;IN RECEIVER  CSR.
                                                                        ;**********************************

     38 022316                                  ESCAPE  TST             ;IF ERROR, BRANCH TO END OF TEST.
        022316  104410                                                                  TRAP    C$ESCAPE
        022320  000072                                                                  .WORD   L10055-.
     39 022322  032777  004000  157740          BIT     #RXACT,@RXCSR   ;IS THE RECEIVER ACTIVE?
     40 022330  001005                          BNE     10$             ;IF YES - OK.
     41 022332                                  ERRDF   25,EMG12,ERRG2
        022332  104455                                                                  TRAP    C$ERDF
        022334  000031                                                                  .WORD   25
        022336  013736                                                                  .WORD   EMG12
        022340  006560                                                                  .WORD   ERRG2
     42 022342  000423                          BR      30$
     43 022344                          10$:
     44 022344  042777  000020  157716          BIC     #RXENA,@RXCSR   ;DISABLE THE RECEIVER
     45 022352                                  $DELAY  4               ;DELAY TO ALLOW DISABLE.

                                                                        ;******** MACRO EXPANSION ********
        022352  004737  006464                  JSR     PC,$DLAY        ;CALL DELAY SUBROUTINE
        022356  000004                          .WORD   4               ;NUMBER OF DELAY LOOPS
                                                                        ;**********************************

     46 022360  032777  004200  157702          BIT     #RXACT!RDATRY,@RXCSR ;CHECK RECEIVER ACTIVE AND DATA READY.
     47 022366  001411                          BEQ     30$             ;IF CLEAR OK
     48 022370                                  ERRDF   26,EMG13,ERRG2
        022370  104455                                                                  TRAP    C$ERDF
        022372  000032                                                                  .WORD   26
        022374  013762                                                                  .WORD   EMG13
        022376  006560                                                                  .WORD   ERRG2
     49 022400  000404                          BR      30$
     50 022402                          20$:
     51 022402                                  ERRDF   27,EMG14,ERRG2
        022402  104455                                                                  TRAP    C$ERDF
        022404  000033                                                                  .WORD   27
        022406  014043                                                                  .WORD   EMG14
        022410  006560                                                                  .WORD   ERRG2
     52 022412                          30$:
     53
     54 022412                          ENDTST
        022412                                                          L10055:
        022412  104401                                                                  TRAP    C$ETST
     55
     56
     57
```

TEST 8 - RECEIVE DATA INTERRUPT

```
                                .SBTTL          TEST 8 - RECEIVE DATA INTERRUPT

                                ;*****************************************************************************
                                ;*              TEST 8 - DPV-11
                                ;* RECEIVE DATA INTERRUPT
                                ;*              MODE: BCP, 8 BIT CHARACTERS, MAINTENANCE MODE LOOPBACK
                                ;* ENABLE THE RECEIVER AND SET RECEIVER INTERRUPT. TRANSMIT DATA.
                                ;* CHECK THAT THE RECEIVE INTERUPT WAS GENERATED. AFTER THE INTERUPT
                                ;* WAS GENERATED DISABLE THE RECEIVER. CHECK THAT THE RECEIVER BECOMES
                                ;* INACTIVE.
                                ;*
                                ;*****************************************************************************
022414                          BGNTST
022414                                                                          T8::

                                        CALL    $RESET          ;RESET THE DPV
022414                                  ESCAPE  TST             ;IF ERROR, EXIT THE TEST
022420  104410                                                                  TRAP    C$ESCAPE
022422  000266                                                                  .WORD   L10056-.
022424  005037  002424                  CLR     TFLAG           ;CLEAR FLAGS USED IN THE INTERRUPT ROUTINES.
022430  005037  002376                  CLR     RFLAG           ;
022434  005037  002360                  CLR     MCFLAG          ;CLEAR MODEM CONTROL FLAG.
022440  012737  000002  002414          MOV     #2,START        ;SEND 2 START CHARACTERS.

022446                                  SETVEC  XMTVEC,#XINT,#PRI04
022446  012746  000200                                                        MOV     #PRI04,-(SP)
022452  012746  017050                                                        MOV     #XINT,-(SP)
022456  013746  002266                                                        MOV     XMTVEC,-(SP)
022462  012746  000003                                                        MOV     #3,-(SP)
022466  104437                                                                TRAP    C$SVEC
022470  062706  000010                                                        ADD     #10,SP
022474                                  SETVEC  RCVEC,#RINT,#PRI04
022474  012746  000200                                                        MOV     #PRI04,-(SP)
022500  012746  016414                                                        MOV     #RINT,-(SP)
022504  013746  002264                                                        MOV     RCVEC,-(SP)
022510  012746  000003                                                        MOV     #3,-(SP)
022514  104437                                                                TRAP    C$SVEC
022516  062706  000010                                                        ADD     #10,SP
022522                                  SETPRI  #PRI00          ;SET PROCESSOR PRIORITY.  FOR LSI 11/03
022522  012700  000000                                                        MOV     #PRI00,R0
022526  104441                                                                TRAP    C$SPRI
                                                                ;THIS WILL ENABLE INTERRUPTS.  FOR 11/23
                                                                ;THIS WILL ALLOW ACKNOWLEDGMENT OF INTERRUPTS
                                                                ;LEVEL 4-7.
                                                                ;SET UP INTERRUPT VECTOR


022530  012777  040252  157534          MOV     #40252,@PCSAR   ;SET BCP MODE AND SYNCH CHARACTER.
022536  012777  000120  157524          MOV     #RXENA!RXITEN,@RXCSR ;ENABLE THE RECEIVER AND SET
                                                                ;SET INTERRUPT ENABLE.
022544  012777  000130  157522          MOV     #TXIE!TXENA!MM,@TXCSR ;ENABLE THE XMITTER AND INT.
                                                                ;SELECT THE MAINTENANCE LOOPBACK.
022552  005003                          CLR     R3              ;CLEAR COUNTER
022554                          5$:
022554  032737  000001  002376          BIT     #1,RFLAG        ;WAS DATA RECEIVED
022562  001007                          BNE     10$             ;IF YES - OK.
```

```
TEST 8 - RECEIVE DATA INTERRUPT
     41 022564  005303                          DEC     R3              ;DECREMENT COUNTER.
     42 022566  001372                          BNE     5$
     43
     44 022570                                  ERRDF   28,EMG15,ERRG2
        022570  104455                                                                  TRAP    C$ERDF
        022572  000034                                                                  .WORD   28
        022574  014117                                                                  .WORD   EMG15
        022576  006560                                                                  .WORD   ERRG2
     45 022600  000430                          BR      30$
     46 022602                          10$:
     47 022602  042777  000020  157460          BIC     #RXENA,@RXCSR   ;DISABLE THE RECEIVER
     48 022610  005037  002376                  CLR     RFLAG           ;CLEAR THE FLAG.
     49 022614                                  $DELAY  5               ;DELAY TO ALLOW DISABLE.

                                                                        ;******** MACRO EXPANSION ********
        022614  004737  006464                  JSR     PC,$DLAY        ;CALL DELAY SUBROUTINE
        022620  000005                                  .WORD   5       ;NUMBER OF DELAY LOOPS
                                                                        ;************************************

     50 022622  005737  002376                  TST     RFLAG           ;WAS AN INTERUPT RECEIVED?
     51 022626  001011                          BNE     20$             ;IF YES - REPORT ERROR.
     52 022630  032777  004200  157432          BIT     #RXACT!RDATRY,@RXCSR ;CHECK RECEIVER ACTIVE AND DATA READY.
     53 022636  001411                          BEQ     30$                  ;IF CLEAR OK
     54 022640                                  ERRDF   29,EMG13,ERRG2
        022640  104455                                                                  TRAP    C$ERDF
        022642  000035                                                                  .WORD   29
        022644  013762                                                                  .WORD   EMG13
        022646  006560                                                                  .WORD   ERRG2
     55 022650  000404                          BR      30$
     56 022652                          20$.
     57 022652                                  ERRDF   30,EMG16,ERRG2
        022652  104455                                                                  TRAP    C$ERDF
        022654  000036                                                                  .WORD   30
        022656  014152                                                                  .WORD   EMG16
        022660  006560                                                                  .WORD   ERRG2
     58 022662                          30$:
     59 022662                                  CALL    $RESET          ;RESET THE DPV.
     60 022666                                  SETPRI  #PRI07          ;SET THE PROCESSOR PRI TO 7
        022666  012700  000340                                                          MOV     #PRI07,R0
        022672  104441                                                                  TRAP    C$SPRI
     61                                                                 ;(THIS WILL DISABLE INTERRUPTS)
     62 022674                                  CLRVEC  RCVEC           ;RESTORE THE RECV. VECTOR
        022674  013700  002264                                                          MOV     RCVEC,R0
        022700  104436                                                                  TRAP    C$CVEC
     63 022702                                  CLRVEC  XMTVEC          ;RESTORE THE XMIT. VECTOR
        022702  013700  002266                                                          MOV     XMTVEC,R0
        022706  104436                                                                  TRAP    C$CVEC
     64
     65 022710                          ENDTST
        022710                                                                  L10056:
        022710  104401                                                                  TRAP    C$ETST
     66
     67
     68
```

TEST 9 - RECEIVER STATUS

```
                                .SBTTL          TEST 9 - RECEIVER STATUS

                                ;*****************************************************************************
                                ;*                      TEST 9 - DPV-11
                                ;* THERE ARE 3 SUBTESTS IN THIS TEST WHICH ARE INTENDED TO CHECK
                                ;* RECEIVER STATUS.
                                ;* SUBTEST 1 -  REOM (RECEIVE END OF MESSAGE)
                                ;*              THIS SUBTEST WILL TRANSMIT A DATA MESSAGE THAT IS
                                ;*              ENDED WITH A TEOM (TRANSMIT END OF MESSAGE).  A
                                ;*              CHECK WILL BE MADE THAT THE RECEIVER GETS THE DATA
                                ;*              AND THAT THE REOM IS RECEIVED WHEN RECEIVE
                                ;*              STATUS IS AVAILABLE.
                                ;*
                                ;* SUBTEST 2 -  RECEIVER OVERRUN
                                ;*              THIS SUBTEST WILL TRANSMIT DATA CORRECTLY.  THE
                                ;*              RECEIVER AFTER BECOMING ACTIVE WILL NOT SERVICE
                                ;*              THE RECEIVE BUFFER CORRECTLY.  THIS SHOULD RESULT IN
                                ;*              A RECEIVE OVERRUN.  THIS SUBTEST WILL ENSURE THAT
                                ;*              WHEN RECEIVE STATUS IS AVAILABLE, THE RECEIVER OVERRUN
                                ;*              IS SET.
                                ;*
                                ;* SUBTEST 3 -  RECEIVER ABORT
                                ;*              THIS SUBTEST WILL TRANSMIT A DATA MESSAGE THAT IS ENDED
                                ;*              WITH A TRANSMIT ABORT.  THE SUBTEST WILL ENSURE THAT
                                ;*              RECEIVE STATUS AVAILABLE IS RECEIVED AND THAT THE
                                ;*              ABORT IS RECEIVED.
                                ;*
                                ;*****************************************************************************
022712                          BGNTST
022712                                                                          T9::
                                BGNSUB
022712                                                                          T9.1:
022712  104402                                                                  TRAP    C$BSUB
022714                                  CALL    $RESET          ;RESET THE DPV
022720                                  ESCAPE  TST             ;IF ERROR, EXIT THE TEST
022720  104410                                                                  TRAP    C$ESCAPE
022722  000774                                                                  .WORD   L10057-.
022724  005037  002424                 CLR     TFLAG           ;CLEAR TRANSMIT INTERRUPT FLAG.
022730  012737  000001  002414         MOV     #1,START        ;# OF START OF MESSAGES.

022736                                  SETVEC  XMTVEC,#XINT,#PRI04
022736  012746  000200                                                          MOV     #PRI04,-(SP)
022742  012746  017050                                                          MOV     #XINT,-(SP)
022746  013746  002266                                                          MOV     XMTVEC,-(SP)
022752  012746  000003                                                          MOV     #3,-(SP)
022756  104437                                                                  TRAP    C$SVEC
022760  062706  000010                                                          ADD     #10,SP
022764                                  SETPRI  #PRI00          ;SET PROCESSOR PRIORITY.  FOR LSI 11/03
022764  012700  000000                                                          MOV     #PRI00,R0
022770  104441                                                                  TRAP    C$SPRI
                                                                ;THIS WILL ENABLE INTERRUPTS.  FOR 11/23
                                                                ;THIS WILL ALLOW ACKNOWLEDGMENT OF INTERRUPTS
                                                                ;LEVEL 4-7.
                                                                ;SET UP INTERRUPT VECTOR

022772  052777  000130  157274         BIS     #TXIE!TXENA!MM,@TXCSR ;ENABLE THE TRANSMITTER AND SELECT
```

TEST 9 - RECEIVER STATUS

```
                                                                    ;MAINTENANCE MODE LOOPBACK.
023000  052777  000020  157262        BIS     #RXENA,@RXCSR   ;ENABLE THE RECEIVER

023006  005003                        CLR     R3              ;INITIALIZE THE COUNTER
023010                          5$:
023010  032777  004000  157252        BIT     #RXACT,@RXCSR   ;IS THE RECEIVER ACTIVE?
023016  001007                        BNE     10$             ;BR IF YES
023020  005303                        DEC     R3              ;DECREMENT THE COUNTER
023022  001372                        BNE     5$
023024                                ERRDF   31,EMG12,ERRG2
023024  104455                                                                  TRAP    C$ERDF
023026  000037                                                                  .WORD   31
023030  013736                                                                  .WORD   EMG12
023032  006560                                                                  .WORD   ERRG2
023034  000444                        BR      45$
023036                          10$:
023036  005003                        CLR     R3              ;INITIALIZE THE COUNTER.
023040                          12$:
023040  032777  002200  157222        BIT     #RSTARY!RDATRY,@RXCSR   ;IS DATA OR STATUS READY?
023046  001407                        BEQ     15$                     ;BR IF NOT
023050  017737  157216  002400        MOV     @RDSR,RSAVE     ;SAVE THE CHARACTER
023056  032737  001000  002400        BIT     #REOM,RSAVE     ;WAS THE RECEIVE END OF MESSAGE RECEIVED?
023064  001007                        BNE     20$
023066                          15$:
023066  005303                        DEC     R3              ;DECREMENT THE COUNTER
023070  001363                        BNE     12$
023072                                ERRDF   32,EMG17,ERRG2
023072  104455                                                                  TRAP    C$ERDF
023074  000040                                                                  .WORD   32
023076  014221                                                                  .WORD   EMG17
023100  006560                                                                  .WORD   ERRG2
023102  000421                        BR      45$
023104                          20$:
023104  032777  002000  157156        BIT     #RSTARY,@RXCSR  ;IS THE STATUS DROPPED?
023112  001405                        BEQ     25$
023114                                ERRDF   33,EMG18,ERRG2
023114  104455                                                                  TRAP    C$ERDF
023116  000041                                                                  .WORD   33
023120  014261                                                                  .WORD   EMG18
023122  006560                                                                  .WORD   ERRG2
023124  000410                        BR      45$
023126                          25$:
023126  032777  004000  157134        BIT     #RXACT,@RXCSR   ;IS THE RECEIVER INACTIVE?
023134  001404                        BEQ     45$             ;BR IF YES
023136                                ERRDF   34,EMG11,ERRG2
023136  104455                                                                  TRAP    C$ERDF
023140  000042                                                                  .WORD   34
023142  013705                                                                  .WORD   EMG11
023144  006560                                                                  .WORD   ERRG2

023146                          45$:

                                ENDSUB
023146                                                          L10060:
023146  104403                                                                  TRAP    C$ESUB

023150                          BGNSUB
```

```
TEST 9 - RECEIVER STATUS
        023150                                                                  T9.2:
        023150  104402                                                                  TRAP    C$BSUB
     84 023152                          CALL    $RESET          ;RESET THE DPV
     85 023156                          ESCAPE  TST             ;IF ERROR, EXIT THE TEST
        023156  104410                                                                  TRAP    C$ESCAPE
        023160  000536                                                                  .WORD   L10057-.
     86
     87 023162  005037  002424          CLR     TFLAG           ;CLEAR TRANSMIT INTERRUPT FLAG.
     88 023166  012737  000001  002414  MOV     #1,START        ;# OF START OF MESSAGES.
     89
     90 023174                          SETVEC  XMTVEC,#XINT,#PRI04
        023174  012746  000200                                                          MOV     #PRI04,-(SP)
        023200  012746  017050                                                          MOV     #XINT,-(SP)
        023204  013746  002266                                                          MOV     XMTVEC,-(SP)
        023210  012746  000003                                                          MOV     #3,-(SP)
        023214  104437                                                                  TRAP    C$SVEC
        023216  062706  000010                                                          ADD     #10,SP
     91 023222                          SETPRI  #PRI00          ;SET PROCESSOR PRIORITY.  FOR LSI 11/03
        023222  012700  000000                                                          MOV     #PRI00,R0
        023226  104441                                                                  TRAP    C$SPRI
     92                                                 ;THIS WILL ENABLE INTERRUPTS.  FOR 11/23
     93                                                 ;THIS WILL ALLOW ACKNOWLEDGMENT OF INTERRUPTS
     94                                                 ;LEVEL 4-7.
     95                                                 ;SET UP INTERRUPT VECTOR
     96
     97 023230  052777  000130  157036  BIS     #TXIE!TXENA!MM,@TXCSR ;ENABLE THE TRANSMITTER AND SELECT
     98                                                                ;MAINTENANCE MODE LOOPBACK.
     99 023236  052777  000020  157024  BIS     #RXENA,@RXCSR   ;ENABLE THE RECEIVER
    100
    101 023244  005003                  CLR     R3              ;INITIALIZE THE COUNTER
    102 023246                  5$:
    103 023246  032777  004000  157014  BIT     #RXACT,@RXCSR   ;IS THE RECEIVER ACTIVE?
    104 023254  001007                  BNE     10$             ;BR IF YES
    105 023256  005303                  DEC     R3              ;DECREMENT THE COUNTER
    106 023260  001372                  BNE     5$
    107 023262                          ERRDF   35,EMG12,ERRG2
        023262  104455                                                                  TRAP    C$ERDF
        023264  000043                                                                  .WORD   35
        023266  013736                                                                  .WORD   EMG12
        023270  006560                                                                  .WORD   ERRG2
    108 023272  000464                  BR      55$
    109 023274                  10$:
    110 023274  005003                  CLR     R3              ;INITIALIZE THE COUNTER.
    111 023276                  12$:
    112 023276  032777  002000  156764  BIT     #RSTARY,@RXCSR  ;IS THE STATUS READY?
    113 023304  001007                  BNE     20$
    114 023306  005303                  DEC     R3              ;DECREMENT THE COUNTER
    115 023310  001372                  BNE     12$
    116
    117 023312                          ERRDF   36,EMG1,ERRG2   ;TIME OUT
        023312  104455                                                                  TRAP    C$ERDF
        023314  000044                                                                  .WORD   36
        023316  013336                                                                  .WORD   EMG1
        023320  006560                                                                  .WORD   ERRG2
    118 023322  000450                  BR      55$
    119
    120 023324                  20$:
```

TEST 9 - RECEIVER STATUS

```
    121
    122 023324  032777  004000  156740          BIT     #ROVER,@RDSR    ;WAS THE RECEIVE OVERRUN RECEIVED?
    123 023332  001005                          BNE     40$             ;IF YES OK.
    124 023334                                  ERRDF   37,EMG19,ERRG2
        023334  104455                                                              TRAP    C$ERDF
        023336  000045                                                              .WORD   37
        023340  014310                                                              .WORD   EMG19
        023342  006560                                                              .WORD   ERRG2
    125 023344  000437                          BR      55$
    126 023346                          40$:
    127
    128 023346  032777  002000  156714          BIT     #RSTARY,@RXCSR  ;WAS THE STATUS CLEARED
    129 023354  001405                          BEQ     42$             ;IF YES OK
    130 023356                                  ERRDF   38,EMG18,ERRG2
        023356  104455                                                              TRAP    C$ERDF
        023360  000046                                                              .WORD   38
        023362  014261                                                              .WORD   EMG18
        023364  006560                                                              .WORD   ERRG2
    131 023366  000426                          BR      55$
    132 023370                          42$:
    133 023370  032777  002000  156672          BIT     #RSTARY,@RXCSR  ;IS THE STATUS READY?
    134 023376  001007                          BNE     47$
    135 023400  005303                          DEC     R3              ;DECREMENT THE COUNTER
    136 023402  001372                          BNE     42$
    137
    138 023404                                  ERRDF   39,EMG1,ERRG2   ;TIME OUT
        023404  104455                                                              TRAP    C$ERDF
        023406  000047                                                              .WORD   39
        023410  013336                                                              .WORD   EMG1
        023412  006560                                                              .WORD   ERRG2
    139 023414  000413                          BR      55$
    140
    141
    142 023416                          47$:
    143 023416  042777  000020  156644          BIC     #RXENA,@RXCSR   ;DISABLE THE RECEIVER.
    144
    145 023424  032777  002000  156636          BIT     #RSTARY,@RXCSR  ;IS THE STATUS DROPPED?
    146 023432  001404                          BEQ     55$
    147 023434                          50$:
    148 023434                                  ERRDF   40,EMG18,ERRG2
        023434  104455                                                              TRAP    C$ERDF
        023436  000050                                                              .WORD   40
        023440  014261                                                              .WORD   EMG18
        023442  006560                                                              .WORD   ERRG2
    149 023444                          55$:
    150
    151 023444                            ENDSUB
        023444                                                          L10061:
        023444  104403                                                              TRAP    C$ESUB
    152
    153
    154
    155 023446                            BGNSUB
        023446                                                          T9.3:
        023446  104402                                                              TRAP    C$BSUB
    156 023450                                  CALL    $RESET          ;RESET THE DPV
    157 023454                                  ESCAPE  TST             ;IF ERROR, EXIT THE TEST
```

```
TEST 9 - RECEIVER STATUS
        023454  104410                                                          TRAP    C$ESCAPE
        023456  000240                                                          .WORD   L10057-.
    158 023460  005037  002424          CLR     TFLAG           ;CLEAR TRANSMIT INTERRUPT FLAG.
    159 023464  012737  000001  002414  MOV     #1,START        ;# OF START OF MESSAGES.
    160 023472  012737  000001  002322  MOV     #1,ABORT        ;SEND AN ABORT
    161
    162 023500                          SETVEC  XMTVEC,#XINT,#PRI04
        023500  012746  000200                                                  MOV     #PRI04,-(SP)
        023504  012746  017050                                                  MOV     #XINT,-(SP)
        023510  013746  002266                                                  MOV     XMTVEC,-(SP)
        023514  012746  000003                                                  MOV     #3,-(SP)
        023520  104437                                                          TRAP    C$SVEC
        023522  062706  000010                                                  ADD     #10,SP
    163 023526                          SETPRI  #PRI00          ;SET PROCESSOR PRIORITY.  FOR LSI 11/03
        023526  012700  000000                                                  MOV     #PRI00,R0
        023532  104441                                                          TRAP    C$SPRI
    164                                         ;THIS WILL ENABLE INTERRUPTS.  FOR 11/23
    165                                         ;THIS WILL ALLOW ACKNOWLEDGMENT OF INTERRUPTS
    166                                         ;LEVEL 4-7.
    167                                         ;SET UP INTERRUPT VECTOR
    168
    169 023534  052777  000130  156532  BIS     #TXIE!TXENA!MM,@TXCSR ;ENABLE THE TRANSMITTER AND SELECT
    170                                                         ;MAINTENANCE MODE LOOPBACK.
    171 023542  052777  000020  156520  BIS     #RXENA,@RXCSR   ;ENABLE THE RECEIVER
    172
    173 023550  005003                  CLR     R3              ;INITIALIZE THE COUNTER
    174 023552                      5$:
    175 023552  032777  004000  156510  BIT     #RXACT,@RXCSR   ;IS THE RECEIVER ACTIVE?
    176 023560  001007                  BNE     10$             ;BR IF YES
    177 023562  005303                  DEC     R3              ;DECREMENT THE COUNTER
    178 023564  001372                  BNE     5$
    179 023566                          ERRDF   41,EMG12,ERRG2
        023566  104455                                                          TRAP    C$ERDF
        023570  000051                                                          .WORD   41
        023572  013736                                                          .WORD   EMG12
        023574  006560                                                          .WORD   ERRG2
    180 023576  000444                  BR      45$
    181 023600                      10$:
    182 023600  005003                  CLR     R3              ;INITIALIZE THE COUNTER.
    183 023602                      12$:
    184 023602  032777  002000  156460  BIT     #RSTARY,@RXCSR  ;IS THE STATUS READY?
    185 023610  001016                  BNE     20$
    186 023612  032777  000200  156450  BIT     #RDATRY,@RXCSR
    187 023620  001403                  BEQ     15$
    188 023622                          $DELAY  5               ;DELAY .5 MSEC.

                                                                ;******** MACRO EXPANSION ********
        023622  004737  006464                  JSR     PC,$DLAY        ;CALL DELAY SUBROUTINE
        023626  000005                          .WORD   5               ;NUMBER OF DELAY LOOPS
                                                                ;**********************************

    189 023630                      15$:
    190 023630  005303                  DEC     R3              ;DECREMENT THE COUNTER
    191 023632  001363                  BNE     12$
    192 023634                          ERRDF   42,EMG1,ERRG2   ;TIME OUT
        023634  104455                                                          TRAP    C$ERDF
        023636  000052                                                          .WORD   42
```

```
TEST 9 - RECEIVER STATUS
        023640  013336                                                          .WORD   EMG1
        023642  006560                                                          .WORD   ERRG2
    193 023644  000421                  BR      45$
    194
    195 023646                  20$:
    196
    197 023646  032777  002000  156416  BIT     #RABORT,@RDSR   ;WAS THE RECEIVE ABORT RECEIVED?
    198 023654  001005                  BNE     40$             ;IF YES OK.
    199 023656                          ERRDF   43,EMG20,ERRG2
        023656  104455                                                          TRAP    C$ERDF
        023660  000053                                                          .WORD   43
        023662  014341                                                          .WORD   EMG20
        023664  006560                                                          .WORD   ERRG2
    200 023666  000410                  BR      45$
    201 023670                  40$:
    202 023670  032777  002000  156372  BIT     #RSTARY,@RXCSR  ;IS THE STATUS DROPPED?
    203 023676  001404                  BEQ     45$
    204
    205 023700                          ERRDF   44,EMG18,ERRG2
        023700  104455                                                          TRAP    C$ERDF
        023702  000054                                                          .WORD   44
        023704  014261                                                          .WORD   EMG18
        023706  006560                                                          .WORD   ERRG2
    206 023710                  45$:
    207 023710  005037  002322          CLR     ABORT           ;CLEAR THE ABORT FLAG.
    208 023714                    ENDSUB
        023714                                                          L10062:
        023714  104403                                                         TRAP    C$ESUB
    209
    210
    211
    212 023716                  ENDTST
        023716                                                          L10057:
        023716  104401                                                         TRAP    C$ETST
    213
    214
```

```
TEST 10 - RECEIVE STATUS INTERRUPT
                                .SBTTL          TEST 10 - RECEIVE STATUS INTERRUPT

                                ;*****************************************************************
                                ;*                      TEST 10 - DPV-11
                                ;* THIS TEST WILL ENSURE THAT INTERRUPTS MAY BE GENERATED WHEN
                                ;* RECEIVE STATUS IS AVAILABLE. EACH OF THE FOLLOWING SUBTESTS
                                ;* WILL GENERATE THE STATUS AS FOLLOWS:
                                ;* SUBTEST 1 -  REOM
                                ;* SUBTEST 2 -  RECEIVER OVERRUN
                                ;* SUBTEST 3 -  RECEIVER ABORT
                                ;*
                                ;*****************************************************************
023720                          BGNTST
023720                                                                  T10::

                                BGNSUB
023720                                                                  T10.1:
023720  104402                                                          TRAP    C$BSUB
023722                                  CALL    $RESET          ;RESET THE DPV
023726                                  ESCAPE  TST             ;IF ERROR, EXIT THE TEST
023726  104410                                                          TRAP    C$ESCAPE
023730  001102                                                          .WORD   L10063-.
023732  005037  002376                  CLR     RFLAG           ;CLEAR RECEIVE INTERRUPT
023736  005037  002424                  CLR     TFLAG           ;CLEAR TRANSMIT INTERRUPT FLAG.
023742  005037  002360                  CLR     MCFLAG          ;CLEAR MODEM CONTROL FLAG.
023746  012737  000001  002414          MOV     #1,START        ;# OF START OF MESSAGES.

023754                                  SETVEC  XMTVEC,#XINT,#PRI04
023754  012746  000200                                                  MOV     #PRI04,-(SP)
023760  012746  017050                                                  MOV     #XINT,-(SP)
023764  013746  002266                                                  MOV     XMTVEC,-(SP)
023770  012746  000003                                                  MOV     #3,-(SP)
023774  104437                                                          TRAP    C$SVEC
023776  062706  000010                                                  ADD     #10,SP
024002                                  SETVEC  RCVEC,#RINT,#PRI04
024002  012746  000200                                                  MOV     #PRI04,-(SP)
024006  012746  016414                                                  MOV     #RINT,-(SP)
024012  013746  002264                                                  MOV     RCVEC,-(SP)
024016  012746  000003                                                  MOV     #3,-(SP)
024022  104437                                                          TRAP    C$SVEC
024024  062706  000010                                                  ADD     #10,SP
024030                                  SETPRI  #PRI00          ;SET PROCESSOR PRIORITY.  FOR LSI 11/03
024030  012700  000000                                                  MOV     #PRI00,R0
024034  104441                                                          TRAP    C$SPRI
                                                        ;THIS WILL ENABLE INTERRUPTS.  FOR 11/23
                                                        ;THIS WILL ALLOW ACKNOWLEDGMENT OF INTERRUPTS
                                                        ;LEVEL 4-7.
                                                        ;SET UP INTERRUPT VECTOR

024036  052777  000130  156230          BIS     #TXIE!TXENA.MM,@TXCSR ;ENABLE THE TRANSMITTER AND SELECT
                                                                      ;MAINTENANCE MODE LOOPBACK.
024044  052777  000120  156216          BIS     #RXITEN!RXENA,@RXCSR  ;ENABLE THE RECEIVER

024052  005003                          CLR     R3              ;INITIALIZE THE COUNTER
024054                          5$:
024054  032777  004000  156206          BIT     #RXACT,@RXCSR   ;IS THE RECEIVER ACTIVE?
```

```
TEST 10 - RECEIVE STATUS INTERRUPT
     39 024062  001007                          BNE     10$             ;BR IF YES
     40 024064  005303                          DEC     R3              ;DECREMENT THE COUNTER
     41 024066  001372                          BNE     5$
     42 024070                                  ERRDF   45,EMG12,ERRG2
        024070  104455                                                          TRAP    C$ERDF
        024072  000055                                                          .WORD   45
        024074  013736                                                          .WORD   EMG12
        024076  006560                                                          .WORD   ERRG2
     43 024100  000434                          BR      45$
     44 024102                          10$:
     45 024102  005003                          CLR     R3              ;INITIALIZE THE COUNTER.
     46 024104                          12$:
     47 024104  032737  000002  002376          BIT     #2,RFLAG        ;WAS STATUS RECEIVED?
     48 024112  001007                          BNE     20$
     49 024114  005303                          DEC     R3              ;DECREMENT THE COUNTER
     50 024116  001372                          BNE     12$
     51 024120                                  ERRDF   46,EMG21,ERRG2
        024120  104455                                                          TRAP    C$ERDF
        024122  000056                                                          .WORD   46
        024124  014370                                                          .WORD   EMG21
        024126  006560                                                          .WORD   ERRG2
     52 024130  000420                          BR      45$
     53
     54 024132                          20$:
     55 024132  032737  001000  002400          BIT     #REOM,RSAVE     ;WAS THE RECEIVE END OF MESSAGE RECEIVED?
     56 024140  001004                          BNE     40$             ;IF YES OK.
     57 024142                                  ERRDF   47,EMG17,ERRG2
        024142  104455                                                          TRAP    C$ERDF
        024144  000057                                                          .WORD   47
        024146  014221                                                          .WORD   EMG17
        024150  006560                                                          .WORD   ERRG2
     58 024152                          40$:
     59 024152  032777  002000  156110          BIT     #RSTARY,@RXCSR  ;IS THE STATUS DROPPED?
     60 024160  001404                          BEQ     45$
     61 024162                                  ERRDF   48,EMG18,ERRG2
        024162  104455                                                          TRAP    C$ERDF
        024164  000060                                                          .WORD   48
        024166  014261                                                          .WORD   EMG18
        024170  006560                                                          .WORD   ERRG2
     62 024172                          45$:
     63 024172                                  SETPRI  #PRI07          ;SET PROCESSOR PRI TO 7
        024172  012700  000340                                                  MOV     #PRI07,R0
        024176  104441                                                          TRAP    C$SPRI
     64                                                             ;(DISABLE INTERRUPT)
     65 024200                                  CLRVEC  RCVEC           ;RESTORE THE INTERRUPT VECTOR.
        024200  013700  002264                                                  MOV     RCVEC,R0
        024204  104436                                                          TRAP    C$CVEC
     66 024206                                  CLRVEC  XMTVEC          ;RESORE THE VECTOR.
        024206  013700  002266                                                  MOV     XMTVEC,R0
        024212  104436                                                          TRAP    C$CVEC
     67
     68 024214                          ENDSUB
        024214                                                          L10064:
        024214  104403                                                          TRAP    C$ESUB
     69
     70 024216                          BGNSUB
        024216                                                          T10.2:
```

```
TEST 10 - RECEIVE STATUS INTERRUPT
     024216  104402                                                                  TRAP    C$BSUB
  71 024220                          CALL    $RESET          ;RESET THE DPV
  72 024224                          ESCAPE  TST             ;IF ERROR, EXIT THE TEST
     024224  104410                                                                  TRAP    C$ESCAPE
     024226  000604                                                                  .WORD   L10063-.
  73
  74 024230  005037  002376          CLR     RFLAG           ;CLEAR RECEIVE INTERRUPT
  75 024234  005037  002424          CLR     TFLAG           ;CLEAR TRANSMIT INTERRUPT FLAG.
  76 024240  005037  002360          CLR     MCFLAG          ;CLEAR MODEM CONTROL FLAG.
  77 024244  012737  000001  002414  MOV     #1,START        ;# OF START OF MESSAGES.
  78 024252  012737  000001  002370  MOV     #1,OVER         ;FLAG TO CREATE RECEIVE OVERRUN.
  79
  80 024260                          SETVEC  XMTVEC,#XINT,#PRI04
     024260  012746  000200                                                          MOV     #PRI04,-(SP)
     024264  012746  017050                                                          MOV     #XINT,-(SP)
     024270  013746  002266                                                          MOV     XMTVEC,-(SP)
     024274  012746  000003                                                          MOV     #3,-(SP)
     024300  104437                                                                  TRAP    C$SVEC
     024302  062706  000010                                                          ADD     #10,SP
  81 024306                          SETVEC  RCVEC,#RINT,#PRI04
     024306  012746  000200                                                          MOV     #PRI04,-(SP)
     024312  012746  016414                                                          MOV     #RINT,-(SP)
     024316  013746  002264                                                          MOV     RCVEC,-(SP)
     024322  012746  000003                                                          MOV     #3,-(SP)
     024326  104437                                                                  TRAP    C$SVEC
     024330  062706  000010                                                          ADD     #10,SP
  82 024334                          SETPRI  #PRI00          ;SET PROCESSOR PRIORITY.  FOR LSI 11/03
     024334  012700  000000                                                          MOV     #PRI00,R0
     024340  104441                                                                  TRAP    C$SPRI
  83                                                        ;THIS WILL ENABLE INTERRUPTS.  FOR 11/23
  84                                                        ;THIS WILL ALLOW ACKNOWLEDGMENT OF INTERRUPTS
  85                                                        ;LEVEL 4-7.
  86                                                        ;SET UP INTERRUPT VECTOR
  87
  88 024342  052777  000130  155724          BIS     #TXIE!TXENA!MM,@TXCSR ;ENABLE THE TRANSMITTER AND SELECT
  89                                                                      ;MAINTENANCE MODE LOOPBACK.
  90 024350  052777  000120  155712          BIS     #RXITEN!RXENA,@RXCSR  ;ENABLE THE RECEIVER
  91
  92 024356  005003                          CLR     R3              ;INITIALIZE THE COUNTER
  93 024360                          5$:
  94 024360  032777  004000  155702          BIT     #RXACT,@RXCSR   ;IS THE RECEIVER ACTIVE?
  95 024366  001007                          BNE     10$             ;BR IF YES
  96 024370  005303                          DEC     R3              ;DECREMENT THE COUNTER
  97 024372  001372                          BNE     5$
  98 024374                          ERRDF   49,EMG12,ERRG2
     024374  104455                                                                  TRAP    C$ERDF
     024376  000061                                                                  .WORD   49
     024400  013736                                                                  .WORD   EMG12
     024402  006560                                                                  .WORD   ERRG2
  99 024404  000434                          BR      45$
 100 024406                          10$:
 101 024406  005003                          CLR     R3              ;INITIALIZE THE COUNTER.
 102 024410                          12$:
 103 024410  032737  000002  002376          BIT     #2,RFLAG        ;WAS STATUS RECEIVED?
 104 024416  001007                          BNE     20$
 105 024420  005303                          DEC     R3              ;DECREMENT THE COUNTER
 106 024422  001372                          BNE     12$
```

```
TEST 10 - RECEIVE STATUS INTERRUPT
    107 024424                                  ERRDF   50,EMG21,ERRG2
        024424  104455                                                      TRAP    C$ERDF
        024426  000062                                                      .WORD   50
        024430  014370                                                      .WORD   EMG21
        024432  006560                                                      .WORD   ERRG2
    108 024434  000420                          BR      45$
    109
    110 024436                              20$:
    111
    112 024436  032737  004000  002400        BIT     #ROVER,RSAVE    ;WAS THE RECEIVE OVERRUN RECEIVED?
    113 024444  001004                        BNE     40$             ;IF YES OK.
    114 024446                                  ERRDF   51,EMG19,ERRG2
        024446  104455                                                      TRAP    C$ERDF
        024450  000063                                                      .WORD   51
        024452  014310                                                      .WORD   EMG19
        024454  006560                                                      .WORD   ERRG2
    115 024456                              40$:
    116 024456  032777  002000  155604        BIT     #RSTARY,@RXCSR  ;IS THE STATUS DROPPED?
    117 024464  001404                        BEQ     45$
    118 024466                                  ERRDF   52,EMG18,ERRG2
        024466  104455                                                      TRAP    C$ERDF
        024470  000064                                                      .WORD   52
        024472  014261                                                      .WORD   EMG18
        024474  006560                                                      .WORD   ERRG2
    119 024476                              45$:
    120 024476                                  SETPRI  #PRI07          ;SET PROCESSOR PRI TO 7
        024476  012700  000340                                                  MOV     #PRI07,R0
        024502  104441                                                          TRAP    C$SPRI
    121                                                         ;(DISABLE INTERRUPT)
    122 024504                                  CLRVEC  RCVEC   ;RESTORE THE INTERRUPT VECTOR.
        024504  013700  002264                                                  MOV     RCVEC,R0
        024510  104436                                                          TRAP    C$CVEC
    123 024512                                  CLRVEC  XMTVEC
        024512  013700  002266                                                  MOV     XMTVEC,R0
        024516  104436                                                          TRAP    C$CVEC
    124 024520  005037  002370                  CLR     OVER            ;CLEAR OVERRUN FLAG.
    125
    126 024524                          ENDSUB
        024524                                                          L10065:
        024524  104403                                                          TRAP    C$ESUB
    127
    128
    129
    130 024526                          BGNSUB
        024526                                                          T10.3:
        024526  104402                                                          TRAP    C$BSUB
    131 024530                                  CALL    $RESET          ;RESET THE DPV
    132 024534                                  ESCAPE  TST             ;IF ERROR, EXIT THE TEST
        024534  104410                                                          TRAP    C$ESCAPE
        024536  000274                                                          .WORD   L10063-.
    133
    134 024540  005037  002376                  CLR     RFLAG           ;CLEAR RECEIVE INTERRUPT
    135 024544  005037  002424                  CLR     TFLAG           ;CLEAR TRANSMIT INTERRUPT FLAG.
    136 024550  005037  002360                  CLR     MCFLAG          ;CLEAR MODEM CONTROL FLAG.
    137 024554  012737  000001  002414          MOV     #1,START        ;# OF START OF MESSAGES.
    138 024562  012737  000001  002322          MOV     #1,ABORT        ;FLAG TO SEND ABORT
    139
```

TEST 10 - RECEIVE STATUS INTERRUPT

```
    140 024570                          SETVEC  XMTVEC,#XINT,#PRI04
        024570  012746  000200                                          MOV     #PRI04,-(SP)
        024574  012746  017050                                          MOV     #XINT,-(SP)
        024600  013746  002266                                          MOV     XMTVEC,-(SP)
        024604  012746  000003                                          MOV     #3,-(SP)
        024610  104437                                                  TRAP    C$SVEC
        024612  062706  000010                                          ADD     #10,SP
    141 024616                          SETVEC  RCVEC,#RINT,#PRI04
        024616  012746  000200                                          MOV     #PRI04,-(SP)
        024622  012746  016414                                          MOV     #RINT,-(SP)
        024626  013746  002264                                          MOV     RCVEC,-(SP)
        024632  012746  000003                                          MOV     #3,-(SP)
        024636  104437                                                  TRAP    C$SVEC
        024640  062706  000010                                          ADD     #10,SP
    142 024644                          SETPRI  #PRI00          ;SET PROCESSOR PRIORITY.  FOR LSI 11/03
        024644  012700  000000                                          MOV     #PRI00,R0
        024650  104441                                                  TRAP    C$SPRI
    143                                         ;THIS WILL ENABLE INTERRUPTS.  FOR 11/23
    144                                         ;THIS WILL ALLOW ACKNOWLEDGMENT OF INTERRUPTS
    145                                         ;LEVEL 4-7.
    146                                         ;SET UP INTERRUPT VECTOR
    147
    148 024652  052777  000130  155414          BIS     #TXIE!TXENA!MM,@TXCSR ;ENABLE THE TRANSMITTER AND SELECT
    149                                                                       ;MAINTENANCE MODE LOOPBACK.
    150 024660  052777  000120  155402          BIS     #RXITEN!RXENA,@RXCSR  ;ENABLE THE RECEIVER
    151
    152 024666  005003                          CLR     R3              ;INITIALIZE THE COUNTER
    153 024670                          5$:
    154 024670  032777  004000  155372          BIT     #RXACT,@RXCSR   ;IS THE RECEIVER ACTIVE?
    155 024676  001007                          BNE     10$             ;BR IF YES
    156 024700  005303                          DEC     R3              ;DECREMENT THE COUNTER
    157 024702  001372                          BNE     5$
    158 024704                          ERRDF   53,EMG12,ERRG2
        024704  104455                                                  TRAP    C$ERDF
        024706  000065                                                  .WORD   53
        024710  013736                                                  .WORD   EMG12
        024712  006560                                                  .WORD   ERRG2
    159 024714  000435                          BR      45$
    160 024716                          10$:
    161 024716  005003                          CLR     R3              ;INITIALIZE THE COUNTER.
    162 024720                          12$:
    163 024720  032737  000002  002376          BIT     #2,RFLAG        ;WAS STATUS RECEIVED?
    164 024726  001007                          BNE     20$
    165 024730  005303                          DEC     R3              ;DECREMENT THE COUNTER
    166 024732  001372                          BNE     12$
    167 024734                          ERRDF   54,EMG21,ERRG2
        024734  104455                                                  TRAP    C$ERDF
        024736  000066                                                  .WORD   54
        024740  014370                                                  .WORD   EMG21
        024742  006560                                                  .WORD   ERRG2
    168 024744  000421                          BR      45$
    169
    170 024746                          20$:
    171 024746  032737  002000  002400          BIT     #RABORT,RSAVE   ;WAS THE RECEIVE ABORT RECEIVED?
    172 024754  001005                          BNE     40$             ;IF YES OK.
    173 024756                          ERRDF   55,EMG20,ERRG2
        024756  104455                                                  TRAP    C$ERDF
```

```
TEST 10 - RECEIVE STATUS INTERRUPT
        024760  000067                                                          .WORD   55
        024762  014341                                                          .WORD   EMG20
        024764  006560                                                          .WORD   ERRG2
    174 024766  000410                          BR      45$
    175 024770                          40$:
    176 024770  032777  002000  155272        BIT     #RSTARY,@RXCSR  ;IS THE STATUS DROPPED?
    177 024776  001404                        BEQ     45$
    178
    179 025000                          ERRDF   56,EMG18,ERRG2
        025000  104455                                                          TRAP    C$ERDF
        025002  000070                                                          .WORD   56
        025004  014261                                                          .WORD   EMG18
        025006  006560                                                          .WORD   ERRG2
    180 025010                          45$:
    181 025010                          SETPRI  #PRI07          ;SET PROCESSOR PRI TO 7
        025010  012700  000340                                                  MOV     #PRI07,R0
        025014  104441                                                          TRAP    C$SPRI
    182                                                         ;(DISABLE INTERRUPT)
    183 025016                          CLRVEC  RCVEC           ;RESTORE THE INTERRUPT VECTOR.
        025016  013700  002264                                                  MOV     RCVEC,R0
        025022  104436                                                          TRAP    C$CVEC
    184 025024  005037  002322                  CLR     ABORT           ;CLEAR THE ABORT FLAG.
    185
    186
    187 025030                          ENDSUB
        025030                                                          L10066:
        025030  104403                                                          TRAP    C$ESUB
    188
    189
    190 025032                          ENDTST
        025032                                                          L10063:
        025032  104401                                                          TRAP    C$ETST
    191
    192
    193
    194
    195
    196
    197
```

```
TEST 11 - RECEIVE AND TRANSMIT INTERRUPT
                                        .SBTTL          TEST 11 - RECEIVE AND TRANSMIT INTERRUPT

                                        ;*********************************************************************
                                        ;*              TEST 11 - DPV-11
                                        ;* RECEIVE AND TRANSMIT INTERRUPT
                                        ;* TRANSM'  AND RECEIVE DATA USING INTERRUPT ROUTINES. THIS TEST
                                        ;* WILL TRANSMIT 4 DATA CHARACTERS. AFTER ENSURING THAT A TRANSMIT
                                        ;* INTERRUPT WAS COMPLETED, THE TEST WILL CHECK TO MAKE SURE THAT AT
                                        ;* LEAST 1 RECEIVE INTERRUPT WAS GENERATED.
                                        ;*
                                        ;*********************************************************************
 12 025034                              BGNTST
    025034                                                                              T11::

 13
 14 025034                                      CALL    $RESET          ;RESET THE DPV
 15 025040                                      ESCAPE  TST             ;IF ERROR, EXIT THE TEST
    025040  104410                                                                      TRAP    C$ESCAPE
    025042  000234                                                                      .WORD   L10067-.
 16 025044  005037  002424                      CLR     TFLAG           ;CLEAR THE FLAGS USED IN THE ISRS.
 17 025050  005037  002376                      CLR     RFLAG
 18 025054  005037  002360                      CLR     MCFLAG          ;CLEAR MODEM CONTROL FLAG.
 19 025060                                      SETVEC  RCVEC,#RINT,#PRI04
    025060  012746  000200                                                              MOV     #PRI04,-(SP)
    025064  012746  016414                                                              MOV     #RINT,-(SP)
    025070  013746  002264                                                              MOV     RCVEC,-(SP)
    025074  012746  000003                                                              MOV     #3,-(SP)
    025100  104437                                                                      TRAP    C$SVEC
    025102  062706  000010                                                              ADD     #10,SP
 20 025106                                      SETVEC  XMTVEC,#XINT,#PRI04
    025106  012746  000200                                                              MOV     #PRI04,-(SP)
    025112  012746  017050                                                              MOV     #XINT,-(SP)
    025116  013746  002266                                                              MOV     XMTVEC,-(SP)
    025122  012746  000003                                                              MOV     #3,-(SP)
    025126  104437                                                                      TRAP    C$SVEC
    025130  062706  000010                                                              ADD     #10,SP
 21 025134                                      SETPRI  #PRI00          ;SET PROCESSOR PRIORITY.  FOR LSI 11/03
    025134  012700  000000                                                              MOV     #PRI00,R0
    025140  104441                                                                      TRAP    C$SPRI
 22                                                                     ;THIS WILL ENABLE INTERRUPTS.  FOR 11/23
 23                                                                     ;THIS WILL ALLOW ACKNOWLEDGMENT OF INTERRUPTS
 24                                                                     ;LEVEL 4-7.
 25                                                                     ;SET UP INTERRUPT VECTOR
 26
 27
 28 025142  012777  043652  155122              MOV     #43652,@PCSAR   ;SET BCP MODE, NO ERROR AND SYNCH CHARACTER.
 29 025150  012737  000002  002414              MOV     #2,START        ;# OF STARTS TO SEND.
 30 025156  012777  000120  155104              MOV     #RXITEN!RXENA,@RXCSR ;ENABLE THE RECEIVER AND SET
 31                                                                     ;SET INTERRUPT ENABLE.
 32 025164  012777  000130  155102              MOV     #TXIE!TXENA!MM,@TXCSR ;ENABLE THE TRANSMITTER AND INT.
 33                                                                     ;SELECT THE MAINTENANCE LOOPBACK.
 34 025172  005001                              CLR     R1              ;LOOP COUNTER
 35 025174                              10$:
 36 025174  022737  000004  002330              CMP     #4,DATA         ;ARE THE 4 DATA CHARACTERS RECEIVED?
 37 025202  001412                              BEQ     20$             ;IF YES - CHECK RECEIVE INTERRUPT.
 38 025204  005301                              DEC     R1              ;DECREMENT COUNTER
 39 025206  001372                              BNE     10$
 40
```

```
TEST 11 - RECEIVE AND TRANSMIT INTERRUPT
     41 025210  005737  002424                    TST     TFLAG           ;WERE ANY XMIT INTERRUPTS RECEIVED
     42 025214  001005                            BNE     20$             ;IF YES, KEEP CHECKING
     43 025216                                    ERRDF   57,EMG9,ERRG2
        025216  104455                                                              TRAP    C$ERDF
        025220  000071                                                              .WORD   57
        025222  013577                                                              .WORD   EMG9
        025224  006560                                                              .WORD   ERRG2
     44 025226  000410                            BR      30$
     45
     46 025230                              20$:
     47 025230  032737  000001  002376            BIT     #1,RFLAG        ;WAS ANY DATA RECEIVED?
     48 025236  001004                            BNE     30$             ;IF YES - OK.
     49 025240                                    ERRDF   58,EMG15,ERRG2
        025240  104455                                                              TRAP    C$ERDF
        025242  000072                                                              .WORD   58
        025244  014117                                                              .WORD   EMG15
        025246  006560                                                              .WORD   ERRG2
     50
     51 025250                              30$:
     52 025250                                    CALL    $RESET          ;RESET THE DPV
     53 025254                                    SETPRI  #PRI07          ;SET THE PROCESSOR PRI TO 7
        025254  012700  000340                                                       MOV     #PRI07,R0
        025260  104441                                                               TRAP    C$SPRI
     54                                                                      ;(THIS WILL DISABLE INTERRUPTS)
     55 025262                                    CLRVEC  RCVEC           ;RESTORE THE RECV. VECTOR
        025262  013700  002264                                                       MOV     RCVEC,R0
        025266  104436                                                               TRAP    C$CVEC
     56 025270                                    CLRVEC  XMTVEC          ;RESTORE THE XMIT. VECTOR
        025270  013700  002266                                                       MOV     XMTVEC,R0
        025274  104436                                                               TRAP    C$CVEC
     57
     58
     59
     60 025276                              ENDTST
        025276                                                          L10067:
        025276  104401                                                               TRAP    C$ETST
     61
     62
```

```
TEST 12 - MODEM STATUS
                                .SBTTL          TEST 12 - MODEM STATUS

                                ;*****************************************************************
                                ;*              TEST 12 - DPV-11
                                ;* MODEM STATUS
                                ;* IF A PROPER TURNAROUND (H3259 OR H3260) IS ON, THIS TEST WILL
                                ;* CHECK THAT THE FOLLOWING MODEM SIGNALS ARE TURNED AROUND
                                ;* 1. RTS (REQUEST TO SEND)     TURNED AROUND TO CTS (CLEAR TO SEND)
                                ;*                                              & RR  (RECEIVER READY)
                                ;* 2. DTR (DATA TERMINAL READY) TURNED AROUND TO IC  (INCOMING CALL OR RING)
                                ;* 3. SF  (SELECT FREQUENCY)    TURNED AROUND TO SQ  (SIGNAL QUALITY)
                                ;* 4. LL  (LOCAL LOOPBACK)      TURNED AROUND TO DM  (DATA MODE)
                                ;*
                                ;*****************************************************************
 025300                         BGNTST
 025300                                                                          T12::
 025300                                 CALL    $TURN           ;CHECK THE TURNAROUND.
 025304  103530                        BCS     40$             ;SKIP TEST IF NO TURNAROUND.
 025306                         5$:
 025306                                 CALL    $RESET          ;RESET THE DPV
 025312                                 ESCAPE  TST             ;IF ERROR, EXIT THE TEST
 025312  104410                                                                  TRAP    C$ESCAPE
 025314  000252                                                                  .WORD   L10070-.
 025316  012702  000004                 MOV     #RTS,R2         ;SAVE RTS IN REGISTER (FOR ERROR REPORT).
 025322  010277  154742                 MOV     R2,@RXCSR       ;SET RTS
 025326                                 $DELAY  1               ;DELAY 100 MICROSECONDS

                                                                ;******** MACRO EXPANSION ********
 025326  004737  006464                 JSR     PC,$DLAY        ;CALL DELAY SUBROUTINE
 025332  000001                                 .WORD   1       ;NUMBER OF DELAY LOOPS
                                                                ;**********************************

 025334  032777  020000  154726         BIT     #CTS,@RXCSR     ;IS CTS ON?
 025342  001445                         BEQ     10$             ;IF NOT - REPORT.
 025344  032777  010000  154716         BIT     #RR,@RXCSR      ;IS RR (CD) ON
 025352  001441                         BEQ     10$             ;IF NOT - ERROR.
 025354  012702  000002                 MOV     #DTR,R2         ;SAVE DTR IN REGISTER (FOR ERROR REPORT).
 025360  010277  154704                 MOV     R2,@RXCSR       ;SET DTR.
 025364                                 $DELAY  1               ;DELAY 100 MICROSECONDS

                                                                ;******** MACRO EXPANSION ********
 025364  004737  006464                 JSR     PC,$DLAY        ;CALL DELAY SUBROUTINE
 025370  000001                                 .WORD   1       ;NUMBER OF DELAY LOOPS
                                                                ;**********************************

 025372  032777  040000  154670         BIT     #IC,@RXCSR      ;IS RING (IC) SET?
 025400  001426                         BEQ     10$             ;IF NOT - ERROR.
 025402  012702  000001                 MOV     #SF,R2          ;SAVE SF IN REGISTER (FOR ERROR REPORT).
 025406  010277  154656                 MOV     R2,@RXCSR       ;SET REMOTE LOOP/ SEC FREQ
 025412                                 $DELAY  1               ;DELAY 100 MICROSECONDS

                                                                ;******** MACRO EXPANSION ********
 025412  004737  006464                 JSR     PC,$DLAY        ;CALL DELAY SUBROUTINE
 025416  000001                                 .WORD   1       ;NUMBER OF DELAY LOOPS
                                                                ;**********************************

 025420  032777  000040  154646         BIT     #SQ,@TXCSR      ;IS SIGNAL QUALITY SET?
```

```
TEST 12 - MODEM STATUS
     37 025426  001413                          BEQ     10$             ;IF NOT - ERROR.
     38 025430  012702  000010                  MOV     #LL,R2          ;SAVE LL IN REGISTER (FOR ERROR REPORT).
     39 025434  010277  154630                  MOV     R2,@RXCSR       ;SET LOCAL LOOP
     40 025440                                  $DELAY  1               ;DELAY 100 MICROSECONDS

                                                                        ;******** MACRO EXPANSION ********
        025440  004737  006464                  JSR     PC,$DLAY        ;CALL DELAY SUBROUTINE
        025444  000001                          .WORD   1               ;NUMBER OF DELAY LOOPS
                                                                        ;***********************************

     41 025446  032777  001000  154614          BIT     #DM,@RXCSR      ;IS DATA MODE SET?
     42 025454  001004                          BNE     20$
     43
     44 025456                          10$:
     45 025456                                  ERRDF   59,EMG22,ERRG13
        025456  104455                                                                  TRAP    C$ERDF
        025460  000073                                                                  .WORD   59
        025462  014432                                                                  .WORD   EMG22
        025464  010152                                                                  .WORD   ERRG13
     46
     47 025466                          20$:
     48                                                                 ;CLEAR ALL THOSE BITS
     49 025466  042777  000017  154574          BIC     #RTS!DTR!SF!LL,@RXCSR
     50 025474                                  $DELAY  1               ;DELAY 100 MICRO SECONDS

                                                                        ;******** MACRO EXPANSION ********
        025474  004737  006464                  JSR     PC,$DLAY        ;CALL DELAY SUBROUTINE
        025500  000001                          .WORD   1               ;NUMBER OF DELAY LOOPS
                                                                        ;***********************************

     51
     52 025502  012702  000004                  MOV     #RTS,R2         ;CHECK RTS.
     53 025506  030277  154556                  BIT     R2,@RXCSR       ;IS IT SET?
     54 025512  001021                          BNE     30$             ;IF YES, ERROR.
     55 025514  012702  000002                  MOV     #DTR,R2         ;CHECK DTR.
     56 025520  030277  154544                  BIT     R2,@RXCSR       ;IS IT SET?
     57 025524  001014                          BNE     30$             ;IF YES, ERROR.
     58 025526  012777  000001  154534          MOV     #SF,@RXCSR      ;CHECK SF.
     59 025534  030277  154530                  BIT     R2,@RXCSR       ;IS IT SET?
     60 025540  001006                          BNE     30$             ;IF YES, ERROR.
     61 025542  012777  000010  154520          MOV     #LL,@RXCSR      ;CHECK LL
     62 025550  030277  154514                  BIT     R2,@RXCSR       ;IS IT SET?
     63 025554  001404                          BEQ     40$             ;IF NOT, OK
     64 025556                          30$:
     65 025556                                  ERRDF   60,EMG22,ERRG15
        025556  104455                                                                  TRAP    C$ERDF
        025560  000074                                                                  .WORD   60
        025562  014432                                                                  .WORD   EMG22
        025564  010724                                                                  .WORD   ERRG15
     66 025566                          40$:
     67 025566                          ENDTST
        025566                                                                  L10070:
        025566  104401                                                                  TRAP    C$ETST
     68
     69
     70
     71
```

TEST 13 - MODEM STATUS INTERRUPT

```
                                .SBTTL          TEST 13 - MODEM STATUS INTERRUPT

                                ;*******************************************************************
                                ;*              TEST 13 - DPV-11
                                ;* MODEM STATUS INTERRUPT
                                ;* IF A PROPER TURNAROUND (H3259 OR H3260) IS ON, THIS TEST WILL CHECK
                                ;* THAT THE FOLLOWING SUBTESTS WORK CORRECTLY.
                                ;* SUBTEST 1 -  SET DTR (DATA TERMINAL READY), LOCAL LOOP (LL), RTS (REQUEST
                                ;*              TO SEND) WITH ONLY RECEIVE INTERRUPT ENABLED. ENSURE THAT AN
                                ;*              INTERRUPT IS NOT RECEIVED.
                                ;* SUBTEST 2 -  SET DTR, LL AND RTS WITH ONLY DATA SET INTERRUPT ENABLED.
                                ;*              ENSURE THAT AN INTERRUPT IS NOT RECEIVED.
                                ;* SUBTEST 3 -  SET DTR, LL AND RTS WITHOUT ANY INTERRUPTS ENABLED.  ENSURE
                                ;*              THAT AN INTERRUPT IS NOT RECEIVED.
                                ;* SUBTEST 4 -  SET RTS WITH RECEIVE AND DATA SET INTERRUPT ENABLED.  ENSURE
                                ;*              THAT AN INTERRUPT IS RECEIVED.
                                ;* SUBTEST 5 -  SET DTR WITH RECEIVE AND DATA SET INTERRUPT ENABLED.  ENSURE
                                ;*              THAT AN INTERRUPT IS RECEIVED.
                                ;* SUBTEST 6 -  SET LL WITH RECEIVE AND DATA SET INTERRUPT ENABLED.  ENSURE
                                ;*              THAT AN INTERRUPT IS RECEIVED.
                                ;*
                                ;*******************************************************************
025570                          BGNTST
025570                                                                  T13::
025570
025574  103002                          CALL    $TURN           ;CHECK THE TURNAROUND.
025576                          BCC     1$              ;PROCEED IF TURNAROUND.
025576  104432                  EXIT    TST                                             TRAP    C$EXIT
025600  000676                                                                          .WORD   L10071-.
025602                          1$:
                                SETVEC  RCVEC,#RINT,#PRI04
025602  012746  000200                                                                  MOV     #PRI04,-(SP)
025606  012746  016414                                                                  MOV     #RINT,-(SP)
025612  013746  002264                                                                  MOV     RCVEC,-(SP)
025616  012746  000003                                                                  MOV     #3,-(SP)
025622  104437                                                                          TRAP    C$SVEC
025624  062706  000010                                                                  ADD     #10,SP
                                SETPRI  #PRI00          ;SET PROCESSOR PRIORITY.  FOR LSI 11/03
025630  012700  000000                                                                  MOV     #PRI00,R0
025634  104441                                                                          TRAP    C$SPRI
                                                        ;THIS WILL ENABLE INTERRUPTS.  FOR 11/23
                                                        ;THIS WILL ALLOW ACKNOWLEDGMENT OF INTERRUPTS
                                                        ;LEVEL 4-7.
                                                        ;SET UP INTERRUPT VECTOR


025636                          BGNSUB
025636                                                                  T13.1:
025636  104402                                                                        TRAP    C$BSUB
                                CALL    $RESET          ;RESET THE DPV
                                ESCAPE  TST             ;IF ERROR, EXIT THE TEST
025644  104410                                                                      TRAP    C$ESCAPE
025646  000630                                                                      .WORD   L10071-.
025650  005037  002376          CLR     RFLAG           ;CLEAR THE FLAG USED IN THE ISR
025654  005037  002360          CLR     MCFLAG          ;CLEAR MODEM CONTROL FLAG.
```

```
CVDPVAQ DPV11 FUNC DIAG MACRO V03.01 17-JUN-80 16:09:09 PAGE 69-1                                SEQ  148
TEST 13 - MODEM STATUS INTERRUPT

     43
     44 025660  012777  000116  154402          MOV     #RXITEN!LL!DTR!RTS,@RXCSR       ;ENABLE RCV INT AND SET RTS, DTR AND L. LOOP
     45
     46 025666                            10$:
     47 025666                                  $DELAY  10                              ;WAIT 1 MS

                                                                                        ;******** MACRO EXPANSION ********
        025666  004737  006464                  JSR     PC,$DLAY                        ;CALL DELAY SUBROUTINE
        025672  000010                          .WORD   10                              ;NUMBER OF DELAY LOOPS
                                                                                        ;************************************

     48 025674  005737  002360                  TST     MCFLAG                          ;WAS AN MODEM CONTROL INTERRUPT RECEIVED?
     49 025700  001404                          BEQ     30$                             ;IF NOT OK.
     50 025702                                  ERRDF   61,EMG23,ERRG2
        025702  104455                                                                  TRAP    C$ERDF
        025704  000075                                                                  .WORD   61
        025706  014457                                                                  .WORD   EMG23
        025710  006560                                                                  .WORD   ERRG2
     51
     52 025712                            30$:
     53
     54 025712                              ENDSUB
        025712                                                                  L10072:
        025712  104403                                                                  TRAP    C$ESUB
     55
     56
     57 025714                              BGNSUB
        025714                                                                  T13.2:
        025714  104402                                                                  TRAP    C$BSUB
     58 025716                                  CALL    $RESET                          ;RESET THE DPV
     59 025722                                  ESCAPE  TST                             ;IF ERROR, EXIT THE TEST
        025722  104410                                                                  TRAP    C$ESCAPE
        025724  000552                                                                  .WORD   L10071-.
     60 025726  005037  002376                  CLR     RFLAG                           ;CLEAR THE FLAG USED IN THE ISR
     61 025732  005037  002360                  CLR     MCFLAG                          ;CLEAR MODEM CONTROL FLAG.
     62
     63
     64 025736  012777  000056  154324          MOV     #DSITEN.LL!RTS!DTR,@RXCSR       ;ENABLE DS. INT, SET RTS, DTR AND LL
     65
     66 025744                            10$:
     67 025744                                  $DELAY  10                              ;WAIT 1 MS

                                                                                        ;******** MACRO EXPANSION ********
        025744  004737  006464                  JSR     PC,$DLAY                        ;CALL DELAY SUBROUTINE
        025750  000010                          .WORD   10                              ;NUMBER OF DELAY LOOPS
                                                                                        ;************************************

     68 025752  005737  002360                  TST     MCFLAG                          ;WAS AN MODEM CONTROL INTERRUPT RECEIVED?
     69 025756  001404                          BEQ     30$                             ;IF NOT OK.
     70 025760                                  ERRDF   62,EMG23,ERRG2
        025760  104455                                                                  TRAP    C$ERDF
        025762  000076                                                                  .WORD   62
        025764  014457                                                                  .WORD   EMG23
        025766  006560                                                                  .WORD   ERRG2
     71
     72 025770                            30$:
     73
```

```
TEST 13 - MODEM STATUS INTERRUPT
     74 025770                          ENDSUB
        025770                                                                  L10073:
        025770  104403                                                                 TRAP    C$ESUB
     75
     76
     77
     78 025772                          BGNSUB
        025772                                                                  T13.3:
        025772  104402                                                                 TRAP    C$BSUB
     79 025774                                CALL    $RESET          ;RESET THE DPV
     80 026000                                ESCAPE  TST             ;IF ERROR, EXIT THE TEST
        026000  104410                                                                 TRAP    C$ESCAPE
        026002  000474                                                                 .WORD   L10071-.
     81 026004  005037  002376                CLR     RFLAG           ;CLEAR THE FLAG USED IN THE ISR
     82 026010  005037  002360                CLR     MCFLAG          ;CLEAR MODEM CONTROL FLAG.
     83
     84                                                               ;SET LOCAL LOOP, DTR AND RTS.
     85 026014  012777  000016  154246        MOV     #LL!RTS!DTR,@RXCSR
     86 026022                          10$:
     87 026022                                $DELAY  10              ;WAIT 1 MS

                                                                      ;******** MACRO EXPANSION ********
        026022  004737  006464                   JSR     PC,$DLAY        ;CALL DELAY SUBROUTINE
        026026  000010                           .WORD   10              ;NUMBER OF DELAY LOOPS
                                                                      ;************************************

     88 026030  005737  002360                TST     MCFLAG          ;WAS AN INTERRUPT RECEIVED?
     89 026034  001404                        BEQ     30$             ;IF NOT OK.
     90 026036                                ERRDF   63,EMG23,ERRG2
        026036  104455                                                                 TRAP    C$ERDF
        026040  000077                                                                 .WORD   63
        026042  014457                                                                 .WORD   EMG23
        026044  006560                                                                 .WORD   ERRG2
     91
     92 026046                          30$:
     93
     94 026046                            ENDSUB
        026046                                                                  L10074:
        026046  104405                                                                 TRAP    C$ESUB
     95
     96
     97 026050                            BGNSUB
        026050                                                                  T13.4:
        026050  104402                                                                 TRAP    C$BSUB
     98 026052                                CALL    $RESET          ;RESET THE DPV
     99 026056                                ESCAPE  TST             ;IF ERROR, EXIT THE TEST
        026056  104410                                                                 TRAP    C$ESCAPE
        026060  000416                                                                 .WORD   L10071-.
    100 026062  005037  002376                CLR     RFLAG           ;CLEAR THE FLAG USED IN THE ISR
    101 026066  005037  002360                CLR     MCFLAG          ;CLEAR MODEM CONTROL FLAG.
    102
    103                                                               ;ENABLE INTERRUPTS AND SET RTS.
    104 026072  012777  000144  154170        MOV     #RXITEN!DSITEN!RTS,@RXCSR
    105
    106 026100                          10$:
    107 026100                                $DELAY  10              ;WAIT 1 MS
```

```
TEST 13 - MODEM STATUS INTERRUPT

                                                        ;******** MACRO EXPANSION ********
        026100  004737  006464                JSR     PC,$DLAY        ;CALL DELAY SUBROUTINE
        026104  000010                          .WORD   10              ;NUMBER OF DELAY LOOPS
                                                        ;**********************************

    108 026106  005737  002360                TST     MCFLAG          ;WAS AN INTERRUPT RECEIVED?
    109 026112  001015                        BNE     20$             ;IF YES - CHECK FOR MULTIPLE INTERRUPTS.
    110 026114                                ERRDF   64,EMG24,ERRG2
        026114  104455                                                  TRAP    C$ERDF
        026116  000100                                                  .WORD   64
        026120  014535                                                  .WORD   EMG24
        026122  006560                                                  .WORD   ERRG2
    111 026124                                PRINTB  #FMG26
        026124  012746  012575                                          MOV     #FMG26,-(SP)
        026130  012746  000001                                          MOV     #1,-(SP)
        026134  010600                                                  MOV     SP,R0
        026136  104414                                                  TRAP    C$PNTB
        026140  062706  000004                                          ADD     #4,SP
    112 026144  000410                        BR      30$
    113 026146                          20$:
    114 026146  022737  000001  002360        CMP     #1,MCFLAG       ;WAS ONLY 1 RECEIVED?
    115 026154  001404                        BEQ     30$             ;IF YES - OK
    116 026156                                ERRDF   65,EMG40        ;REPORT MULTIPLE INTERRUPTS
        026156  104455                                                  TRAP    C$ERDF
        026160  000101                                                  .WORD   65
        026162  015175                                                  .WORD   EMG40
        026164  000000                                                  .WORD   0
    117 026166                          30$:
    118
    119 026166                            ENDSUB
        026166                                                      L10075:
        026166  104403                                                  TRAP    C$ESUB
    120
    121
    122 026170                          BGNSUB
        026170                                                          T13.5:
        026170  104402                                                  TRAP    C$BSUB
    123 026172                                CALL    $RESET          ;RESET THE DPV
    124 026176                                ESCAPE  TST             ;IF ERROR, EXIT THE TEST
        026176  104410                                                  TRAP    C$ESCAPE
        026200  000276                                                  .WORD   L10071-.
    125 026202  005037  002376                CLR     RFLAG           ;CLEAR THE FLAG USED IN THE ISR
    126 026206  005037  002360                CLR     MCFLAG          ;CLEAR MODEM CONTROL FLAG.
    127
    128                                                 ;ENABLE INTERRUPTS AND SET DTR.
    129 026212  012777  000142  154050        MOV     #RXITEN!DSITEN.DTR,@RXCSR
    130
    131 026220                          10$:
    132 026220                                $DELAY  10              ;WAIT 1 MS

                                                        ;******** MACRO EXPANSION ********
        026220  004737  006464                JSR     PC,$DLAY        ;CALL DELAY SUBROUTINE
        026224  000010                          .WORD   10              ;NUMBER OF DELAY LOOPS
                                                        ;**********************************

    133 026226  005737  002360                TST     MCFLAG          ;WAS AN INTERRUPT RECEIVED?
    134 026232  001015                        BNE     20$             ;IF YES - CHECK FOR MULTIPLE INTERRUPTS.
```

```
    135 026234                          ERRDF   66,EMG24,ERRG2
        026234  104455                                              TRAP    C$ERDF
        026236  000102                                              .WORD   66
        026240  014535                                              .WORD   EMG24
        026242  006560                                              .WORD   ERRG2
    136 026244                          PRINTB  #FMG26
        026244  012746  012575                                      MOV     #FMG26,-(SP)
        026250  012746  000001                                      MOV     #1,-(SP)
        026254  010600                                              MOV     SP,R0
        026256  104414                                              TRAP    C$PNTB
        026260  062706  000004                                      ADD     #4,SP
    137 026264  000410                  BR      30$
    138 026266                      20$:
    139 026266  022737  000001  002360  CMP     #1,MCFLAG       ;WAS ONLY 1 RECEIVED?
    140 026274  001404                  BEQ     30$             ;IF YES - OK
    141 026276                          ERRDF   67,EMG40        ;REPORT MULTIPLE INTERRUPTS
        026276  104455                                              TRAP    C$ERDF
        026300  000103                                              .WORD   67
        026302  015175                                              .WORD   EMG40
        026304  000000                                              .WORD   0
    142 026306                      30$:
    143
    144 026306                        ENDSUB
        026306                                                  L10076:
        026306  104403                                              TRAP    C$ESUB
    145
    146
    147 026310                        BGNSUB
        026310                                                  T13.6:
        026310  104402                                              TRAP    C$BSUB
    148 026312                          CALL    $RESET          ;RESET THE DPV
    149 026316                          ESCAPE  TST             ;IF ERROR, EXIT THE TEST
        026316  104410                                              TRAP    C$ESCAPE
        026320  000156                                              .WORD   L10071-.
    150 026322  005037  002376          CLR     RFLAG           ;CLEAR THE FLAG USED IN THE ISR
    151 026326  005037  002360          CLR     MCFLAG          ;CLEAR MODEM CONTROL FLAG.
    152
    153                                                         ;ENABLE INTERRUPTS AND SET LL.
    154 026332  012777  000150  153730  MOV     #RXITEN!DSITEN!LL,@RXCSR
    155
    156 026340                      10$:
    157 026340                          $DELAY  10              ;WAIT 1 MS

                                                                ;******** MACRO EXPANSION ********
        026340  004737  006464          JSR     PC,$DLAY        ;CALL DELAY SUBROUTINE
        026344  000010                  .WORD   10              ;NUMBER OF DELAY LOOPS
                                                                ;**********************************

    158 026346  005737  002360          TST     MCFLAG          ;WAS AN INTERRUPT RECEIVED?
    159 026352  001025                  BNE     20$             ;IF YES - CHECK FOR MULTIPLE INTERRUPTS.
    160 026354                          ERRDF   68,EMG24,ERRG2
        026354  104455                                              TRAP    C$ERDF
        026356  000104                                              .WORD   68
        026360  014535                                              .WORD   EMG24
        026362  006560                                              .WORD   ERRG2
    161 026364                          PRINTB  #FMG26
        026364  012746  012575                                      MOV     #FMG26,-(SP)
```

```
TEST 13 - MODEM STATUS INTERRUPT
        026370  012746  000001                                                  MOV     #1,-(SP)
        026374  010600                                                          MOV     SP,R0
        026376  104414                                                          TRAP    C$PNTB
        026400  062706  000004                                                  ADD     #4,SP
    162 026404                          PRINTB  #FMG29
        026404  012746  013075                                                  MOV     #FMG29,-(SP)
        026410  012746  000001                                                  MOV     #1,-(SP)
        026414  010600                                                          MOV     SP,R0
        026416  104414                                                          TRAP    C$PNTB
        026420  062706  000004                                                  ADD     #4,SP
    163 026424  000410                  BR      30$
    164 026426                  20$:
    165 026426  022737  000001  002360  CMP     #1,MCFLAG       ;WAS ONLY 1 RECEIVED?
    166 026434  001404                  BEQ     30$             ;IF YES - OK
    167 026436                          ERRDF   69,EMG40        ;REPORT MULTIPLE INTERRUPTS
        026436  104455                                                          TRAP    C$ERDF
        026440  000105                                                          .WORD   69
        026442  015175                                                          .WORD   EMG40
        026444  000000                                                          .WORD   0
    168 026446                  30$:
    169
    170 026446                    ENDSUB
        026446                                                          L10077:
        026446  104403                                                          TRAP    C$ESUB
    171
    172
    173
    174 026450                          CALL    $RESET          ;RESET THE DPV
    175 026454                          SETPRI  #PRI07          ;SET THE PROCESSOR PRI TO 7
        026454  012700  000340                                                  MOV     #PRI07,R0
        026460  104441                                                          TRAP    C$SPRI
    176                                                         ;(THIS WILL DISABLE INTERRUPTS)
    177 026462                          CLRVEC  RCVEC           ;RESTORE THE RECV. VECTOR
        026462  013700  002264                                                  MOV     RCVEC,R0
        026466  104436                                                          TRAP    C$CVEC
    178 026470                          CLRVEC  XMTVEC          ;RESTORE THE XMIT. VECTOR
        026470  013700  002266                                                  MOV     XMTVEC,R0
        026474  104436                                                          TRAP    C$CVEC
    179
    180
    181 026476                  ENDTST
        026476                                                          L10071:
        026476  104401                                                          TRAP    C$ETST
    182
    183
    184
```

TEST 14 - RECEIVE AND MODEM STATUS INTERRUPTS

```
                                .SBTTL          TEST 14 - RECEIVE AND MODEM STATUS INTERRUPTS

                                ;*****************************************************************
                                ;*              TEST 14 - DPV-11
                                ;* RECEIVE AND MODEM STATUS INTERRUPTS
                                ;* CHANGE THE MODEM STATUS WHILE HANDLING A RECEIVE INTERRUPT.
                                ;* ENSURE THAT THE MODEM STATUS INTERRUPT IS RECEIVED.
                                ;* SUBTEST 1 -  CHANGE RTS DURING THE RECEIVE INTERRUPT.  ENSURE THAT
                                ;*              THE DATA SET INTERRUPT WAS RECEIVED.
                                ;* SUBTEST 2 -  CHANGE DTR DURING THE RECEIVE INTERRUPT.  ENSURE THAT
                                ;*              THE DATA SET INTERRUPT WAS RECEIVED.
                                ;* SUBTEST 3 -  CHANGE LL DURING THE RECEIVE INTERRUPT.  ENSURE THAT
                                ;*              THE DATA SET INTERRUPT WAS RECEIVED.
                                ;*
                                ;*****************************************************************
026500                          BGNTST
026500                                                                          T14::
026500                                  CALL    $TURN           ;CHECK THE TURNAROUND.
026504  103002                          BCC     1$              ;PROCEED, IF TURNAROUND ON.
026506                                  EXIT    TST             ;IF NO TURNAROUND, EXIT.
026506  104432                                                                  TRAP    C$EXIT
026510  001072                                                                  .WORD   L10100-.
026512                          1$:
026512                            BGNSUB
026512                                                                          T14.1:
026512  104402                                                                  TRAP    C$BSUB
026514                                  CALL    $RESET          ;RESET THE DPV
026520                                  ESCAPE  TST             ;IF ERROR, EXIT THE TEST
026520  104410                                                                  TRAP    C$ESCAPE
026522  001060                                                                  .WORD   L10100-.
026524  005037  002424                  CLR     TFLAG           ;CLEAR THE FLAGS USED IN THE ISRS.
026530  005037  002376                  CLR     RFLAG
026534  005037  002360                  CLR     MCFLAG          ;CLEAR MODEM CONTROL FLAG.
026540  012737  000004  002432          MOV     #RTS,TOGGLE     ;TOGGLE RTS

026546                                  SETVEC  RCVEC,#RINT,#PRI04
026546  012746  000200                                                          MOV     #PRI04,-(SP)
026552  012746  016414                                                          MOV     #RINT,-(SP)
026556  013746  002264                                                          MOV     RCVEC,-(SP)
026562  012746  000003                                                          MOV     #3,-(SP)
026566  104437                                                                  TRAP    C$SVEC
026570  062706  000010                                                          ADD     #10,SP
026574                                  SETVEC  XMTVEC,#XINT,#PRI04
026574  012746  000200                                                          MOV     #PRI04,-(SP)
026600  012746  017050                                                          MOV     #XINT,-(SP)
026604  013746  002266                                                          MOV     XMTVEC,-(SP)
026610  012746  000003                                                          MOV     #3,-(SP)
026614  104437                                                                  TRAP    C$SVEC
026616  062706  000010                                                          ADD     #10,SP
026622                                  SETPRI  #PRI00          ;SET PROCESSOR PRIORITY.  FOR LSI 11/03
026622  012700  000000                                                          MOV     #PRI00,R0
026626  104441                                                                  TRAP    C$SPRI
                                                        ;THIS WILL ENABLE INTERRUPTS.  FOR 11/23
                                                        ;THIS WILL ALLOW ACKNOWLEDGMENT OF INTERRUPTS
                                                        ;LEVEL 4-7.
                                                        ;SET UP INTERRUPT VECTOR
```

```
TEST 14 - RECEIVE AND MODEM STATUS INTERRUPTS
     37
     38 026630  012777  043652  153434          MOV     #43652,@PCSAR   ;SET BCP MODE, NO ERROR AND SYNCH CHARACTER.
     39 026636  012737  000002  002414          MOV     #2,START        ;# OF START CHARACTERS.
     40 026644  012777  000160  153416          MOV     #RXITEN!DSITEN!RXENA,@RXCSR ;ENABLE THE RECEIVER AND INT.
     41 026652  012777  000130  153414          MOV     #TXIE!TXENA!MM,@TXCSR ;ENABLE THE TRANSMITTER AND INT.
     42                                                                    ;SELECT THE MAINTENANCE LOOPBACK.
     43 026660  005001                          CLR     R1              ;LOOP COUNTER
     44 026662                          10$:
     45 026662  005737  002360                  TST     MCFLAG          ;WAS A MODEM CHANGE INTERRUPT RECEIVED?
     46 026666  001017                          BNE     20$             ;IF YES, EXIT.
     47 026670  005301                          DEC     R1              ;DECREMENT COUNTER
     48 026672  001373                          BNE     10$
     49
     50 026674                                  ERRDF   70,EMG24,ERRG2
        026674  104455                                                          TRAP    C$ERDF
        026676  000106                                                          .WORD   70
        026700  014535                                                          .WORD   EMG24
        026702  006560                                                          .WORD   ERRG2
     51
     52 026704                                  PRINTB  #FMG26          ;NOTIFY THAT INTERRUPT MAY BE DISABLED BY
        026704  012746  012575                                                  MOV     #FMG26,-(SP)
        026710  012746  000001                                                  MOV     #1,-(SP)
        026714  010600                                                          MOV     SP,R0
        026716  104414                                                          TRAP    C$PNTB
        026720  062706  000004                                                  ADD     #4,SP
     53                                                     ;REMOVING THE WIRE WRAP.
     54 026724  000410                          BR      30$
     55 026726                          20$:
     56 026726  022737  000001  002360          CMP     #1,MCFLAG       ;WAS ONLY 1 RECEIVED?
     57 026734  001404                          BEQ     30$             ;IF YES - OK
     58 026736                                  ERRDF   71,EMG40        ;REPORT MULTIPLE INTERRUPTS
        026736  104455                                                          TRAP    C$ERDF
        026740  000107                                                          .WORD   71
        026742  015175                                                          .WORD   EMG40
        026744  000000                                                          .WORD   0
     59 026746                          30$:
     60 026746                                  CALL    $RESET          ;RESET THE DPV
     61 026752                                  SETPRI  #PRI07          ;SET THE PROCESSOR PRI TO 7
        026752  012700  000340                                                  MOV     #PRI07,R0
        026756  104441                                                          TRAP    C$SPRI
     62                                                     ;(THIS WILL DISABLE INTERRUPTS)
     63 026760                                  CLRVEC  RCVEC           ;RESTORE THE RECV. VECTOR
        026760  013700  002264                                                  MOV     RCVEC,R0
        026764  104436                                                          TRAP    L$CVEC
     64 026766                                  CLRVEC  XMTVEC          ;RESTORE THE XMIT. VECTOR
        026766  013700  002266                                                  MOV     XMTVEC,R0
        026772  104436                                                          TRAP    C$CVEC
     65 026774                                  ESCAPE  TST             ;IF ERROR, ESCAPE
        026774  104410                                                          TRAP    C$ESCAPE
        026776  000604                                                          .WORD   L10100-.
     66
     67 027000                          ENDSUB
        027000                                                          L10101:
        027000  104403                                                          TRAP    C$ESUB
     68
     69 027002                          BGNSUB
        027002                                                          T14.2:
```

```
TEST 14 - RECEIVE AND MODEM STATUS INTERRUPTS
     027002  104402                                                                  TRAP    C$BSUB
  70 027004                          CALL    $RESET          ;RESET THE DPV
  71 027010                          ESCAPE  TST             ;IF ERROR, EXIT THE TEST
     027010  104410                                                                  TRAP    C$ESCAPE
     027012  000570                                                                  .WORD   L10100-.
  72 027014  005037  002424          CLR     TFLAG           ;CLEAR THE FLAGS USED IN THE ISRS.
  73 027020  005037  002376          CLR     RFLAG
  74 027024  005037  002360          CLR     MCFLAG          ;CLEAR MODEM CONTROL FLAG.
  75 027030  012737  000002  002432  MOV     #DTR,TOGGLE     ;TOGGLE DTR.
  76
  77 027036                          SETVEC  RCVEC,#RINT,#PRI04
     027036  012746  000200                                                          MOV     #PRI04,-(SP)
     027042  012746  016414                                                          MOV     #RINT,-(SP)
     027046  013746  002264                                                          MOV     RCVEC,-(SP)
     027052  012746  000003                                                          MOV     #3,-(SP)
     027056  104437                                                                  TRAP    C$SVEC
     027060  062706  000010                                                          ADD     #10,SP
  78 027064                          SETVEC  XMTVEC,#XINT,#PRI04
     027064  012746  000200                                                          MOV     #PRI04,-(SP)
     027070  012746  017050                                                          MOV     #XINT,-(SP)
     027074  013746  002266                                                          MOV     XMTVEC,-(SP)
     027100  012746  000003                                                          MOV     #3,-(SP)
     027104  104437                                                                  TRAP    C$SVEC
     027106  062706  000010                                                          ADD     #10,SP
  79 027112                          SETPRI  #PRI00          ;SET PROCESSOR PRIORITY.  FOR LSI 11/03
     027112  012700  000000                                                          MOV     #PRI00,R0
     027116  104441                                                                  TRAP    C$SPRI
  80                                 ;THIS WILL ENABLE INTERRUPTS.  FOR 11/23
  81                                 ;THIS WILL ALLOW ACKNOWLEDGMENT OF INTERRUPTS
  82                                 ;LEVEL 4-7.
  83                                 ;SET UP INTERRUPT VECTOR
  84
  85
  86 027120  012777  043652  153144          MOV     #43652,@PCSAR   ;SET BCP MODE, NO ERROR AND SYNCH CHARACTER.
  87 027126  012737  000002  002414          MOV     #2,START        ;# OF START CHARACTERS.
  88 027134  012777  000160  153126          MOV     #RXITEN!DSITEN!RXENA,@RXCSR ;ENABLE THE RECEIVER AND INT.
  89 027142  012777  000130  153124          MOV     #TXIE!TXENA!MM,@TXCSR ;ENABLE THE TRANSMITTER AND INT.
  90                                                                              ;SELECT THE MAINTENANCE LOOPBACK.
  91 027150  005001                          CLR     R1              ;LOOP COUNTER
  92 027152                          10$:
  93 027152  005737  002360                  TST     MCFLAG          ;WAS A MODEM CHANGE INTERRUPT RECEIVED?
  94 027156  001017                          BNE     20$             ;IF YES, EXIT.
  95 027160  005301                          DEC     R1              ;DECREMENT COUNTER
  96 027162  001373                          BNE     10$
  97
  98 027164                          ERRDF   72,EMG24,ERRG2
     027164  104455                                                                  TRAP    C$ERDF
     027166  000110                                                                  .WORD   72
     027170  014535                                                                  .WORD   EMG24
     027172  006560                                                                  .WORD   ERRG2
  99
 100 027174                          PRINTB  #FMG26          ;NOTIFY THAT INTERRUPT MAY BE DISABLED BY
     027174  012746  012575                                                          MOV     #FMG26,-(SP)
     027200  012746  000001                                                          MOV     #1,-(SP)
     027204  010600                                                                  MOV     SP,R0
     027206  104414                                                                  TRAP    C$PNTB
     027210  062706  000004                                                          ADD     #4,SP
```

```
                                                        ;REMOVING THE WIRE WRAP.
027214  000410                          BR      30$
027216                          20$:
027216  022737  000001  002360          CMP     #1,MCFLAG       ;WAS ONLY 1 RECEIVED?
027224  001404                          BEQ     30$             ;IF YES - OK
027226                                  ERRDF   73,EMG40        ;REPORT MULTIPLE INTERRUPTS
                                                                        TRAP    C$ERDF
                                                                        .WORD   73
                                                                        .WORD   EMG40
                                                                        .WORD   0
027236                          30$:
027236                                  CALL    $RESET          ;RESET THE DPV
027242                                  SETPRI  #PRI07          ;SET THE PROCESSOR PRI TO 7
                                                                        MOV     #PRI07,R0
027242  012700  000340                  TRAP    C$SPRI
027246  104441
                                                        ;(THIS WILL DISABLE INTERRUPTS)
027250                                  CLRVEC  RCVEC           ;RESTORE THE RECV. VECTOR
                                                                        MOV     RCVEC,R0
027250  013700  002264                  TRAP    C$CVEC
027254  104436
027256                                  CLRVEC  XMTVEC          ;RESTORE THE XMIT. VECTOR
                                                                        MOV     XMTVEC,R0
027256  013700  002266                  TRAP    C$CVEC
027262  104436
027264                                  ESCAPE  TST             ;IF ERROR, ESCAPE
                                                                        TRAP    C$ESCAPE
027264  104410                          .WORD   L10100-.
027266  000314

027270                          ENDSUB
                                                                L10102:
027270                                                                  TRAP    C$ESUB
027270  104403

027272                          BGNSUB
                                                                T14.3:
027272                                                                  TRAP    C$BSUB
027272  104402
027274                                  CALL    $RESET          ;RESET THE DPV
027300                                  ESCAPE  TST             ;IF ERROR, EXIT THE TEST
                                                                        TRAP    C$ESCAPE
027300  104410                          .WORD   L10100-.
027302  000300
027304  005037  002424                  CLR     TFLAG           ;CLEAR THE FLAGS USED IN THE ISRS.
027310  005037  002376                  CLR     RFLAG
027314  005037  002360                  CLR     MCFLAG          ;CLEAR MODEM CONTROL FLAG.
027320  012737  000010  002432          MOV     #LL,TOGGLE      ;TOGGLE LL

027326                                  SETVEC  RCVEC,#RINT,#PRI04
                                                                        MOV     #PRI04,-(SP)
027326  012746  000200                                                  MOV     #RINT,-(SP)
027332  012746  016414                                                  MOV     RCVEC,-(SP)
027336  013746  002264                                                  MOV     #3,-(SP)
027342  012746  000003                                                  TRAP    C$SVEC
027346  104437                                                          ADD     #10,SP
027350  062706  000010
027354                                  SETVEC  XMTVEC,#XINT,#PRI04
                                                                        MOV     #PRI04,-(SP)
027354  012746  000200                                                  MOV     #XINT,-(SP)
027360  012746  017050                                                  MOV     XMTVEC,-(SP)
027364  013746  002266                                                  MOV     #3,-(SP)
027370  012746  000003                                                  TRAP    C$SVEC
027374  104437                                                          ADD     #10,SP
027376  062706  000010
027402                                  SETPRI  #PRI00          ;SET PROCESSOR PRIORITY.  FOR LSI 11/03
```

```
TEST 14 - RECEIVE AND MODEM STATUS INTERRUPTS
        027402  012700  000000                                                  MOV     #PRI00,R0
        027406  104441                                                          TRAP    C$SPRI
    128                                         ;THIS WILL ENABLE INTERRUPTS.  FOR 11/23
    129                                         ;THIS WILL ALLOW ACKNOWLEDGMENT OF INTERRUPTS
    130                                         ;LEVEL 4-7.
    131                                         ;SET UP INTERRUPT VECTOR
    132
    133
    134 027410  012777  043652  152654        MOV     #43652,@PCSAR   ;SET BCP MODE, NO ERROR AND SYNCH CHARACTER.
    135 027416  012737  000002  002414        MOV     #2,START        ;# OF START CHARACTERS.
    136 027424  012777  000160  152636        MOV     #RXITEN!DSITEN!RXENA,@RXCSR ;ENABLE THE RECEIVER AND INT.
    137 027432  012777  000130  152634        MOV     #TXIE!TXENA!MM,@TXCSR ;ENABLE THE TRANSMITTER AND INT.
    138                                                                     ;SELECT THE MAINTENANCE LOOPBACK.
    139 027440  005001                        CLR     R1              ;LOOP COUNTER
    140 027442                          10$:
    141 027442  005737  002360                TST     MCFLAG          ;WAS A MODEM CHANGE INTERRUPT RECEIVED?
    142 027446  001027                        BNE     20$             ;IF YES, EXIT.
    143 027450  005301                        DEC     R1              ;DECREMENT COUNTER
    144 027452  001373                        BNE     10$
    145
    146 027454                                ERRDF   74,EMG24,ERRG2
        027454  104455                                                          TRAP    C$ERDF
        027456  000112                                                          .WORD   74
        027460  014535                                                          .WORD   EMG24
        027462  006560                                                          .WORD   ERRG2
    147
    148 027464                                PRINTB  #FMG26          ;NOTIFY THAT INTERRUPT MAY BE DISABLED BY
        027464  012746  012575                                                  MOV     #FMG26,-(SP)
        027470  012746  000001                                                  MOV     #1,-(SP)
        027474  010600                                                          MOV     SP,R0
        027476  104414                                                          TRAP    C$PNTB
        027500  062706  000004                                                  ADD     #4,SP
    149                                                 ;REMOVING THE WIRE WRAP.
    150 027504                                PRINTB  #FMG29
        027504  012746  013075                                                  MOV     #FMG29,-(SP)
        027510  012746  000001                                                  MOV     #1,-(SP)
        027514  010600                                                          MOV     SP,R0
        027516  104414                                                          TRAP    C$PNTB
        027520  062706  000004                                                  ADD     #4,SP
    151 027524  000410                        BR      30$
    152 027526                          20$:
    153 027526  022737  000001  002360        CMP     #1,MCFLAG       ;WAS ONLY 1 RECEIVED?
    154 027534  001404                        BEQ     30$             ;IF YES - OK
    155 027536                                ERRDF   75,EMG40        ;REPORT MULTIPLE INTERRUPTS
        027536  104455                                                          TRAP    C$ERDF
        027540  000113                                                          .WORD   75
        027542  015175                                                          .WORD   EMG40
        027544  000000                                                          .WORD   0
    156 027546                          30$:
    157 027546                                CALL    $RESET          ;RESET THE DPV
    158 027552                                SETPRI  #PRI07          ;SET THE PROCESSOR PRI TO 7
        027552  012700  000340                                                  MOV     #PRI07,R0
        027556  104441                                                          TRAP    C$SPRI
    159                                                 ;(THIS WILL DISABLE INTERRUPTS)
    160 027560                                CLRVEC  RCVEC           ;RESTORE THE RECV. VECTOR
        027560  013700  002264                                                  MOV     RCVEC,R0
        027564  104436                                                          TRAP    C$CVEC
```

```
TEST 14 - RECEIVE AND MODEM STATUS INTERRUPTS
    161 027566                          CLRVEC  XMTVEC          ;RESTORE THE XMIT. VECTOR
        027566  013700  002266                                                  MOV     XMTVEC,R0
        027572  104436                                                         TRAP    C$CVEC
    162 027574                          ESCAPE  TST             ;IF ERROR, ESCAPE
        027574  104410                                                         TRAP    C$ESCAPE
        027576  000004                                                         .WORD   L10100-.
    163
    164 027600                      ENDSUB
        027600                                                          L10103:
        027600  104403                                                         TRAP    C$ESUB
    165
    166 027602                  ENDTST
        027602                                                          L10100:
        027602  104401                                                         TRAP    C$ETST
    167
```

```
                        .SBTTL          TEST 15 - SECONDARY & ALL PARTIES ADDRESSING

                        ;*****************************************************************
                        ;*              TEST 15 - DPV-11
                        ;* SUBTEST 1 - SECONDARY ADDRESS
                        ;*      SEGMENT 1 -     SELECT SECONDARY ADDRESS AND SEND THE CORRECT
                        ;*                      ADDRESS.  CHECK THE DATA IS PROPERLY RECEIVED.
                        ;*      SEGMENT 2 -     SELECT SECONDARY ADDRESS AND SEND A MESSAGE WITHOUT
                        ;*                      SENDING USING THE SECONDARY ADDRESS.  CHECK THAT A
                        ;*                      TIME OUT IS RECEIVED.
                        ;*
                        ;* SUBTEST 2 - ALL PARTIES ADDRESSING
                        ;*      SEGMENT 1 -     SFLECT ALL PARTIES AND SECONDARY ADDRESS.  SEND A
                        ;*                      MESSAGE USING THE ALL PARTIES ADDRESS.  ENSURE THAT
                        ;*                      THE MESSAGE IS CORRECTLY RECEIVED.
                        ;*      SEGMENT 2 -     SELECT ALL PARTIES AND SECONDARY ADDRESS.  SEND A
                        ;*                      MESSAGE WITHOUT ALL PARTIES OR SECONDARY ADDRESS.
                        ;*                      CHECK THAT A TIME OUT IS RECEIVED.
                        ;*      SEGMENT 3 -     SELECT ALL PARTIES AND SECONDARY ADDRESS.  SEND A
                        ;*                      MESSAGE WITH A SECONDARY ADDRESS.  CHECK THAT A
                        ;*                      TIME OUT IS RECEIVED.
                        ;*
                        ;*****************************************************************
027604                  BGNTST
027604                                                                  T15::
025
026 027604                BGNSUB
027604                                                                  T15.1:
027604  104402                                                                  TRAP    C$BSUB
027 027606                  BGNSEG
027606  104404                                                                  TRAP    C$BSEG
028 027610
029 027614
027614  104410                                                                  TRAP    C$ESCAPE
027616  000674                                                                  .WORD   L10104-.
030 027620  012737  100000  002362        MOV     #BOP,MODE       ;FLAG THAT WE ARE IN BOP MODE.
031 027626  012737  000000  002344        MOV     #CCITT1,IPCSAR  ;SET CRC-CCITT PRESET TO ONE
032 027634  052737  010120  002344        BIS     #SECADR!120,IPCSAR ;SECONDARY ADDRESS
033 027642  012737  000001  002414        MOV     #1,START        ;SEND 1 FLAG
034 027650  012737  000002  002340        MOV     #2,HEADER       ;SEND 2 HEADER CHARACTERS
035 027656  012737  000003  002352        MOV     #3,LENGTH       ;CHARACTER LENGTH OF 3 BITS.
036 027664  012737  000400  002434        MOV     #TSOM,TSTART    ;START OF MESSAGE.
037 027672  012737  001000  002422        MOV     #TEOM,TEND      ;END OF MESSAGE
038 027700  012737  002502  002470        MOV     #$CCITT,XTYPE   ;USE CCITT DATA PATTERN
039 027706  012737  000012  002472        MOV     #10.,XCOUNT     ;# OF CHARACTERS TO TRANSMIT
040                                       ;
041 027714  013777  002344  152350        MOV     IPCSAR,@PCSAR   ;SET UP PARAMETERS AND ADDRESS
042 027722  112737  000143  002342        MOVB    #143,IPCR       ;SET UP CHARACTER LENGTH
043
044
045 027730                                CALL    $BUFRS          ;SET UP TRANSMIT AND RECEIVE BUFFERS.
046 027734  012737  000001  002356        MOV     #1,MAINT        ;FLAG TO USE MAINTENANCE MODE LOOPBACK.
047 027742  005037  002334                CLR     EXERR           ;FLAG THAT NO ERRORS ARE EXPECTED IN $DATA
048 027746                                CALL    $DATA           ;
049 027752                                ESCAPE  TST             ;IF ERROR - EXIT
027752  104410                                                                  TRAP    C$ESCAPE
027754  000536                                                                  .WORD   L10104-.
```

```
TEST 15 - SECONDARY & ALL PARTIES ADDRESSING
     50
     51 027756                                  CALL    $CHECK          ;CHECK THAT THE DATA WAS CORRECT.
     52 027762                                  ESCAPE  TST             ;IF ERROR - EXIT
        027762  104410                                                                  TRAP    C$ESCAPE
        027764  000526                                                                  .WORD   L10104-.
     53 027766                              ENDSEG
        027766                                                                  10000$:
        027766  104405                                                                  TRAP    C$ESEG
     54
     55 027770                              BGNSEG
        027770  104404                                                                  TRAP    C$BSEG
     56 027772                                  CALL    $RESET          ;RESET THE DPV
     57 027776                                  ESCAPE  TST             ;IF ERROR, BR TO THE END.
        027776  104410                                                                  TRAP    C$ESCAPE
        030000  000512                                                                  .WORD   L10104-.
     58 030002  012737  000001  002414          MOV     #1,START        ;SEND 1 FLAG
     59 030010  012737  000002  002340          MOV     #2,HEADER       ;SEND 2 HEADER CHARACTERS
     60                                                                 ;
     61 030016  013777  002344  152246          MOV     IPCSAR,@PCSAR   ;SET UP PARAMETERS AND ADDRESS
     62 030024  112737  000143  002342          MOVB    #143,IPCR       ;SET UP CHARACTER LENGTH
     63
     64 030032  012737  000001  002430          MOV     #1,TIMER        ;CHANGE TIMEOUT VALUE
     65 030040  012737  000001  002334          MOV     #1,EXERR        ;FLAG THAT AN ERROR IS EXPECTED IN $DATA
     66 030046  105037  002673                  CLRB    XMTBUF          ;CLEAR SECONDARY ADDRESS FROM XMIT BUFFER.
     67 030052                                  CALL    $DATA           ;
     68 030056  013737  002412  002430          MOV     SAVTIM,TIMER    ;RESTORE THE TIMER
     69 030064  005737  002426                  TST     TIMEO           ;DID THE RECEIVER TIME OUT?
     70 030070  001004                          BNE     1$              ;IF YES - OK.
     71 030072                                  ERRDF   76,EMG35
        030072  104455                                                                  TRAP    C$ERDF
        030074  000114                                                                  .WORD   76
        030076  015011                                                                  .WORD   EMG35
        030100  000000                                                                  .WORD   0
     72 030102                          1$:
     73 030102                            ENDSEG
        030102                                                                  10001$:
        030102  104405                                                                  TRAP    C$ESEG
     74 030104                          ENDSUB
        030104                                                                  L10105:
        030104  104403                                                                  TRAP    C$ESUB
     75
     76
     77 030106                          BGNSUB
        030106                                                                  T15.2:
        030106  104402                                                                  TRAP    C$BSUB
     78 030110                            BGNSEG
        030110  104404                                                                  TRAP    C$BSEG
     79 030112                                CALL    $RESET          ;RESET THE DPV
     80 030116                                ESCAPE  TST             ;IF ERROR, BR TO THE END.
        030116  104410                                                                  TRAP    C$ESCAPE
        030120  000372                                                                  .WORD   L10104-.
     81 030122  012737  100000  002362          MOV     #BOP,MODE       ;FLAG THAT WE ARE IN BOP MODE.
     82 030130  012737  000400  002344          MOV     #CCITT0,IPCSAR  ;SET CRC-CCITT PRESET TO ZERO
     83 030136  052737  110231  002344          BIS     #APA!SECADR!231,IPCSAR  ;ALL PARTIES ADDRESS AND
     84                                                                         ;SECONDARY ADDRESS
     85 030144  012737  000001  002414          MOV     #1,START        ;SEND 1 FLAG
     86 030152  012737  000002  002340          MOV     #2,HEADER       ;SEND 2 HEADER CHARACTERS
```

```
TEST 15 - SECONDARY & ALL PARTIES ADDRESSING
     87 030160  012737  000004  002352          MOV     #4,LENGTH       ;CHARACTER LENGTH OF 5 BITS.
     88 030166  012737  000400  002434          MOV     #TSOM,TSTART    ;START OF MESSAGE.
     89 030174  012737  001000  002422          MOV     #TEOM,TEND      ;END OF MESSAGE
     90 030202  012737  002502  002470          MOV     #$CCITT,XTYPE   ;USE CCITT DATA PATTERN
     91 030210  012737  000012  002472          MOV     #10.,XCOUNT     ;# OF CHARACTERS TO TRANSMIT
     92                                                                 ;
     93 030216  013777  002344  152046          MOV     IPCSAR,@PCSAR   ;SET UP PARAMETERS AND ADDRESS
     94 030224  112737  000204  002342          MOVB    #204,IPCR       ;SET UP CHARACTER LENGTH
     95
     96
     97 030232                                  CALL    $BUFRS          ;SET UP TRANSMIT AND RECEIVE BUFFERS.
     98 030236  012737  000001  002356          MOV     #1,MAINT        ;FLAG TO USE MAINTENANCE MODE LOOPBACK.
     99 030244  005037  002334                  CLR     EXERR           ;FLAG THAT NO ERRORS ARE EXPECTED IN $DATA
    100 030250                                  CALL    $DATA           ;
    101 030254                                  ESCAPE  TST             ;IF ERROR - EXIT
        030254  104410                                                                  TRAP    C$ESCAPE
        030256  000234                                                                  .WORD   L10104-.
    102
    103 030260                                  CALL    $CHECK          ;CHECK THAT THE DATA WAS CORRECT.
    104 030264                                  ESCAPE  TST             ;IF ERROR - EXIT
        030264  104410                                                                  TRAP    C$ESCAPE
        030266  000224                                                                  .WORD   L10104-.
    105 030270                          ENDSEG
        030270                                                                  10000$:
        030270  104405                                                                  TRAP    C$ESEG
    106
    107 030272                          BGNSEG
        030272  104404                                                                  TRAP    C$BSEG
    108 030274                              CALL    $RESET          ;RESET THE DPV
    109 030300                              ESCAPE  TST             ;IF ERROR, BR TO THE END.
        030300  104410                                                                  TRAP    C$ESCAPE
        030302  000210                                                                  .WORD   L10104-.
    110 030304  012737  000001  002414          MOV     #1,START        ;SEND 1 FLAG
    111 030312  012737  000002  002340          MOV     #2,HEADER       ;SEND 2 HEADER CHARACTERS
    112                                                                 ;
    113 030320  013777  002344  151744          MOV     IPCSAR,@PCSAR   ;SET UP PARAMETERS AND ADDRESS
    114 030326  112737  000204  002342          MOVB    #204,IPCR       ;SET UP CHARACTER LENGTH
    115
    116 030334  012737  000001  002430          MOV     #1,TIMER        ;CHANGE TIME OUT VALUE
    117 030342  012737  000001  002334          MOV     #1,EXERR        ;FLAG THAT AN ERROR IS EXPECTED IN $DATA
    118 030350  105037  002673                  CLRB    XMTBUF          ;CLEAR SECONDARY ADDRESS FROM XMIT BUFFER.
    119 030354                                  CALL    $DATA           ;
    120 030360  013737  002412  002430          MOV     SAVTIM,TIMER    ;RESTORE THE TIME OUT VALUE.
    121 030366  005737  002426                  TST     TIMEO           ;DID THE RECEIVER TIME OUT?
    122 030372  001006                          BNE     1$              ;IF YES - OK.
    123 030374                                  ERRDF   77,EMG35
        030374  104455                                                                 TRAP    C$ERDF
        030376  000115                                                                 .WORD   77
        030400  015011                                                                 .WORD   EMG35
        030402  000000                                                                 .WORD   0
    124 030404                                  ESCAPE  TST
        030404  104410                                                                 TRAP    C$ESCAPE
        030406  000104                                                                 .WORD   L10104-.
    125 030410                          1$:
    126 030410                              ENDSEG
        030410                                                                  10001$:
        030410  104405                                                                 TRAP    C$ESEG
```

```
TEST 15 - SECONDARY & ALL PARTIES ADDRESSING
    127
    128 030412                          BGNSEG
        030412  104404                                                          TRAP    C$BSEG
    129 030414                              CALL    $RESET          ;RESET THE DPV
    130 030420                              ESCAPE  TST             ;IF ERROR, BR TO THE END.
        030420  104410                                                          TRAP    C$ESCAPE
        030422  000070                                                          .WORD   L10104-.
    131 030424  012737  000001  002414      MOV     #1,START        ;SEND 1 FLAG
    132 030432  012737  000002  002340      MOV     #2,HEADER       ;SEND 2 HEADER CHARACTERS
    133                                     ;
    134 030440  013777  002344  151624      MOV     IPCSAR,@PCSAR   ;SET UP PARAMETERS AND ADDRESS
    135 030446  112737  000204  002342      MOVB    #204,IPCR       ;SET UP CHARACTER LENGTH
    136
    137 030454  112737  000231  002673      MOVB    #231,XMTBUF     ;CHANGE FIRST XMIT CHARACTER.
    138 030462  005037  002334              CLR     EXERR           ;FLAG THAT NO ERRORS ARE EXPECTED IN $DATA
    139 030466                              CALL    $DATA           ;
    140 030472                              ESCAPE  TST             ;IF ERROR - EXIT
        030472  104410                                                          TRAP    C$ESCAPE
        030474  000016                                                          .WORD   L10104-.
    141
    142 030476                              CALL    $CHECK          ;CHECK THAT THE DATA WAS CORRECT.
    143 030502                              ESCAPE  TST             ;IF ERROR - EXIT
        030502  104410                                                          TRAP    C$ESCAPE
        030504  000006                                                          .WORD   L10104-.
    144 030506                          ENDSEG
        030506                                                          10002$:
        030506  104405                                                          TRAP    C$ESEG
    145 030510                      ENDSUB
        030510                                                          L10106:
        030510  104403                                                          TRAP    C$ESUB
    146
    147
    148 030512                  ENDTST
        030512                                                          L10104:
        030512  104401                                                          TRAP    C$ETST
```

```
TEST 16 - ABORT TEST
                                .SBTTL          TEST 16 - ABORT TEST

                                ;*****************************************************************
                                ;*              TEST 16 - DPV-11
                                ;* ABORT TEST
                                ;* SUBTEST 1 -  ABORT WITH IDLE CLEAR. ABORT CHARACTERS TRANSMITTED WHEN
                                ;*              THE ABORT BIT IS ASSERTED.
                                ;*              SELECTED OPTIONS: BOP MODE, CRC-CCITT PRESET TO 1,
                                ;*                                5 BIT CHARACTERS, MAINTENANCE MODE LOOPBACK.
                                ;*
                                ;* SUBTEST 2 -  ABORT WITH IDLE SET. FLAGS TRANSMITTED WHEN THE ABORT BIT
                                ;*              IS ASSERTED.
                                ;*              SELECTED OPTIONS: BOP MODE, NO ERROR CHECKING, IDLE SET,
                                ;*                                5 BIT CHARACTERS, MAINTENANCE MODE LOOPBACK.
                                ;*
                                ;*****************************************************************
030514                          BGNTST
030514                                                                          T16::
                                  BGNSUB
030514                                                                          T16.1:
030514  104402                                                                  TRAP    C$BSUB
                                        CALL    $RESET          ;RESET THE DPV
                                        ESCAPE  TST             ;IF ERROR, BR TO THE END.
030522  104410                                                                  TRAP    C$ESCAPE
030524  000312                                                                  .WORD   L10107-.
030526  012737  100000  002362          MOV     #BOP,MODE       ;FLAG THAT WE ARE IN BOP MODE.
030534  012737  000000  002344          MOV     #CCITT1,IPCSAR  ;SET CRC-CCITT PRESET TO ONE
030542  012737  000001  002414          MOV     #1,START        ;SEND 1 FLAG
030550  012737  000002  002340          MOV     #2,HEADER       ;SEND 2 HEADER CHARACTERS
030556  012737  000005  002352          MOV     #5,LENGTH       ;CHARACTER LENGTH OF 5 BITS.
030564  012737  000400  002434          MOV     #TSOM,TSTART    ;START OF MESSAGE.
030572  012737  002000  002422          MOV     #TXABO,TEND     ;END OF MESSAGE
030600  012737  002502  002470          MOV     #$CCITT,XTYPE   ;USE CCITT DATA PATTERN
030606  012737  000014  002472          MOV     #12.,XCOUNT     ;# OF CHARACTERS TO TRANSMIT
                                                                ;
030614  013777  002344  151450          MOV     IPCSAR,@PCSAR   ;SET UP PARAMETERS AND ADDRESS
030622  112737  000245  002342          MOVB    #245,IPCR       ;SET UP CHARACTER LENGTH


030630                                  CALL    $BUFRS          ;SET UP TRANSMIT AND RECEIVE BUFFERS.
030634  012737  000001  002356          MOV     #1,MAINT        ;FLAG TO USE MAINTENANCE MODE LOOPBACK.
030642  012737  000001  002334          MOV     #1,EXERR        ;FLAG THAT AN ERROR IS EXPECTED IN $DATA
030650                                  CALL    $DATA           ;
030654  032737  002000  002350          BIT     #RABORT,IRDSR   ;WAS AN ABORT RECEIVED?
030662  001004                          BNE     20$             ;IF YES - OK.
030664                                  ERRDF   78,EMG32        ;ABORT NOT RECEIVED.
030664  104455                                                                  TRAP    C$ERDF
030666  000116                                                                  .WORD   78
030670  014677                                                                  .WORD   EMG32
030672  000000                                                                  .WORD   0
030674                          20$:
030674                            ENDSUB
030674                                                                  L10110:
030674  104403                                                                  TRAP    C$ESUB

030676                            BGNSUB
030676                                                                          T16.2:
```

```
CVDPVA0 DPV11 FUNC DIAG MACRO V03.01 17-JUN-80 16:09:09 PAGE 73-1                SEQ  164
TEST 16 - ABORT TEST
        030676  104402                                                          TRAP    C$BSUB
     46 030700                          CALL    $RESET          ;RESET THE DPV
     47 030704                          ESCAPE  TST             ;IF ERROR, BR TO THE END.
        030704  104410                                                          TRAP    C$ESCAPE
        030706  000130                                                          .WORD   L10107-.
     48 030710  012737  001000  002344  MOV     #NONE1,IPCSAR   ;NO ERROR CHECKING.
     49 030716  052737  004000  002344  BIS     #IDLE,IPCSAR    ;SET THE IDLE BIT.
     50 030724  012737  000001  002414  MOV     #1,START        ;SEND 1 FLAG
     51 030732  012737  000002  002340  MOV     #2,HEADER       ;SEND 2 HEADER CHARACTERS
     52 030740  012737  002502  002470  MOV     #$CCITT,XTYPE   ;USE CCITT DATA PATTERN
     53 030746  012737  000014  002472  MOV     #12.,XCOUNT     ;# OF CHARACTERS TO TRANSMIT
     54                                                         ;
     55 030754  013777  002344  151310  MOV     IPCSAR,@PCSAR   ;SET UP PARAMETERS AND ADDRESS
     56 030762  112737  000245  002342  MOVB    #245,IPCR       ;SET UP CHARACTER LENGTH
     57
     58
     59 030770                          CALL    $BUFRS          ;SET UP TRANSMIT AND RECEIVE BUFFERS.
     60 030774  012737  000001  002356  MOV     #1,MAINT        ;FLAG TO USE MAINTENANCE MODE LOOPBACK.
     61 031002  012737  000001  002334  MOV     #1,EXERR        ;FLAG THAT AN ERROR IS EXPECTED IN $DATA
     62 031010                          CALL    $DATA           ;
     63 031014  032737  002000  002350  BIT     #RABORT,IRDSR   ;WAS AN ABORT RECEIVED?
     64 031022  001404                  BEQ     20$             ;IF NOT - OK.
     65 031024                          ERRDF   79,EMG33        ;ABORT NOT RECEIVED.
        031024  104455                                                          TRAP    C$ERDF
        031026  000117                                                          .WORD   79
        031030  014722                                                          .WORD   EMG33
        031032  000000                                                          .WORD   0
     66 031034                  20$:
     67 031034                    ENDSUB
        031034                                                          L10111:
        031034  104403                                                          TRAP    C$ESUB
     68
     69 031036                  ENDTST
        031036                                                          L10107:
        031036  104401                                                          TRAP    C$ETST
```

```
TEST 17 - EXTENDED CONTROL AND ADDRESSING
                                        .SBTTL          TEST 17 - EXTENDED CONTROL AND ADDRESSING
                                        ;*******************************************************************************
                                        ;*              TEST 17 - DPV-11
                                        ;* EXTENDED CONTROL AND ADDRESSING TEST
                                        ;* CHECK THAT THE RECEIVER CAN RECOGNIZE EXTENDED ADDRESSING AND CONTROL
                                        ;* CHARACTERS.
                                        ;*      SELECTED OPTIONS: BOP MODE, CRC-CCITT PRESET TO 1,
                                        ;*                        3 BIT CHARACTERS, MAINTENANCE MODE LOOPBACK,
                                        ;*                        EXTENDED CONTROL AND ADDRESSING SELECTED
                                        ;*
                                        ;*******************************************************************************
031040                                  BGNTST
031040                                                                                          T17::
                                                CALL    $RESET          ;RESET THE DPV
                                                ESCAPE  TST             ;IF ERROR, BR TO THE END.
031044  104410                                                                                  TRAP    C$ESCAPE
031046  000142                                                                                  .WORD   L10112-.
031050  012737  100000  002362                  MOV     #BOP,MODE       ;FLAG THAT WE ARE IN BOP MODE.
031056  012737  000000  002344                  MOV     #CCITT1,IPCSAR  ;SET CRC-CCITT PRESET TO ONE
031064  012737  000001  002414                  MOV     #1,START        ;SEND 1 FLAG
031072  012737  000004  002340                  MOV     #4,HEADER       ;SEND 2 HEADER CHARACTERS
031100  012737  000003  002352                  MOV     #3,LENGTH       ;CHARACTER LENGTH OF 3 BITS.
031106  012737  000400  002434                  MOV     #TSOM,TSTART    ;START OF MESSAGE.
031114  012737  001000  002422                  MOV     #TEOM,TEND      ;END OF MESSAGE
031122  012737  002502  002470                  MOV     #$CCITT,XTYPE   ;USE CCITT DATA PATTERN
031130  012737  000100  002472                  MOV     #64.,XCOUNT     ;# OF CHARACTERS TO TRANSMIT
                                                                        ;
031136  013777  002344  151126                  MOV     IPCSAR,@PCSAR   ;SET UP PARAMETERS AND ADDRESS
031144  112737  000173  002342                  MOVB    #173,IPCR       ;SET UP CHARACTER LENGTH AND EXTENDED
                                                                        ;ADDRESS AND CONTROL BITS.
031152  112777  000030  151124                  MOVB    #30,@PCR        ;SET THE EXTENDED ADDRESS AND CONTROL BITS.


031160                                          CALL    $BUFRS          ;SET UP TRANSMIT AND RECEIVE BUFFERS.
031164  012737  000001  002356                  MOV     #1,MAINT        ;FLAG TO USE MAINTENANCE MODE LOOPBACK.
031172  005037  002334                          CLR     EXERR           ;FLAG THAT NO ERRORS ARE EXPECTED IN $DATA
031176                                          CALL    $DATA           ;
031202  103402                                  BCS     20$             ;IF ERROR SKIP DATA CHECK.

031204                                          CALL    $CHECK          ;CHECK THAT THE DATA WAS CORRECT.
031210                                  20$:


031210                                  ENDTST
031210                                                                                  L10112:
031210  104401                                                                                  TRAP    C$ETST


```

TEST 18 - TRANSMIT GO AHEAD

```
                                .SBTTL          TEST 18 - TRANSMIT GO AHEAD
                                ;*****************************************************************************
                                ;*              TEST 18 - DPV-11
                                ;* TRANSMIT GO AHEAD
                                ;* TERMINATE A MESSAGE USING TRANSMIT GO AHEAD.  CHECK THAT THE RECEIVE
                                ;* ABORT BIT IS SET WHEN THE END OF MESSAGE IS RECEIVED.
                                ;*      SELECTED OPTIONS: BOP MODE, CRC-CCITT PRESET TO 1, LOOP SET,
                                ;*                        5 BIT CHARACTERS, MAINTENANCE MODE LOOPBACK.
                                ;*
                                ;*****************************************************************************
031212                          BGNTST
031212                                                                          T18::
                                
031212                                  CALL    $RESET          ;RESET THE DPV
031216                                  ESCAPE  TST             ;IF ERROR, BR TO THE END.
031216  104410                                                                  TRAP    C$ESCAPE
031220  000200                                                                  .WORD   L10113-.
031222  012737  100000  002362          MOV     #BOP,MODE       ;FLAG THAT WE ARE IN BOP MODE.
031230  012737  000000  002344          MOV     #CCITT1,IPCSAR  ;SET CRC-CCITT PRESET TO ONE
031236  052737  020000  002344          BIS     #LOOP,IPCSAR    ;SET LOOP MODE TO RECOGNIZE GO AHEAD
031244  012737  000001  002414          MOV     #1,START        ;SEND 1 FLAG
031252  012737  000002  002340          MOV     #2,HEADER       ;SEND 2 HEADER CHARACTERS
031260  012737  000005  002352          MOV     #5,LENGTH       ;CHARACTER LENGTH OF 5 BITS.
031266  012737  000400  002434          MOV     #TSOM,TSTART    ;START OF MESSAGE.
031274  012737  005000  002422          MOV     #TGA!TEOM,TEND  ;TRANSMIT GO AHEAD AT THE END OF MESSAGE
031302  012737  002502  002470          MOV     #$CCITT,XTYPE   ;USE CCITT DATA PATTERN
031310  012737  000012  002472          MOV     #10.,XCOUNT     ;# OF CHARACTERS TO TRANSMIT
                                                                ;
031316  013777  002344  150746          MOV     IPCSAR,@PCSAR   ;SET UP PARAMETERS AND ADDRESS
031324  112737  000245  002342          MOVB    #245,IPCR       ;SET UP CHARACTER LENGTH
                                
                                
031332                                  CALL    $BUFRS          ;SET UP TRANSMIT AND RECEIVE BUFFERS.
031336  012737  000001  002356          MOV     #1,MAINT        ;FLAG TO USE MAINTENANCE MODE LOOPBACK.
031344  012737  000001  002334          MOV     #1,EXERR        ;FLAG THAT AN ERROR IS EXPECTED IN $DATA
031352                                  CALL    $DATA           ;
031356  103420                          BCS     20$             ;IF ERROR SKIP DATA CHECK.
                                
031360                                  CALL    $CHECK          ;CHECK THAT THE DATA WAS CORRECT.
031364                                  ESCAPE  TST             ;IF ERROR - EXIT
031364  104410                                                                  TRAP    C$ESCAPE
031366  000032                                                                  .WORD   L10113-.
                                
031370  032737  001000  002350          BIT     #REOM,IRDSR     ;WAS END OF MESSAGE RECEIVED?
031376  001404                          BEQ     10$             ;IF NOT ERROR
031400  032737  002000  002350          BIT     #RABORT,IRDSR   ;WAS AN GO AHEAD RECEIVED?
031406  001004                          BNE     20$             ;IF YES - OK.
031410                          10$:
031410                                  ERRDF   80,EMG33        ;GO AHEAD NOT RECEIVED
031410  104455                                                                  TRAP    C$ERDF
031412  000120                                                                  .WORD   80
031414  014722                                                                  .WORD   EMG33
031416  000000                                                                  .WORD   0
031420                          20$:
```

```
TEST 18 - TRANSMIT GO AHEAD
     49 031420                          ENDTST
        031420
        031420  104401                                  L10113:
                                                                TRAP    C$ETST
     50
     51
```

TEST 19 - ASSEMBLED BIT COUNT

```
                                .SBTTL          TEST 19 - ASSEMBLED BIT COUNT

                                ;*******************************************************************************
                                ;*              TEST 19 - DPV-11
                                ;* ASSEMBLED BIT COUNT
                                ;* TRANSMIT VARIOUS BIT LENGTHS WHILE RECEIVING AN 8 BIT CHARACTER.
                                ;* ENSURE THAT THE ASSEMBLED BIT COUNT (ABC) IS CORRECT UPON THE END
                                ;* OF MESSAGE.
                                ;*      SELECTED OPTIONS: BOP MODE, NO ERROR CHECKING, VARIOUS BIT
                                ;*                        LENGTH CHARACTERS, MAINTENANCE MODE LOOPBACK.
                                ;*
                                ;*******************************************************************************
031422                          BGNTST
031422                                                                          T19::

031422  012737  100000  002362          MOV     #BOP,MODE       ;FLAG THAT WE ARE IN BOP MODE.
031430  012737  003400  002344          MOV     #NOERR,IPCSAR   ;NO ERROR CHECKING

031436  012737  000007  002352          MOV     #7,LENGTH       ;CHARACTER LENGTH.

031444  012737  000400  002434          MOV     #TSOM,TSTART    ;START OF MESSAGE.
031452  012737  001000  002422          MOV     #TEOM,TEND      ;ABORT MESSAGE
031460  012737  002502  002470          MOV     #$CCITT,XTYPE   ;USE CCITT DATA PATTERN
031466  012737  000001  002472          MOV     #1,XCOUNT       ;# OF CHARACTERS TO TRANSMIT
031474                                  CALL    $BUFRS          ;SET UP TRANSMIT AND RECEIVE BUFFERS.
031500  012737  000001  002352          MOV     #1,LENGTH       ;CHANGE THE LENGTH
031506                          7$:                             ;
031506                                  CALL    $RESET          ;RESET THE DPV
031512                                  ESCAPE  TST             ;IF ERROR, BR TO THE END.
031512  104410                                                                  TRAP    C$ESCAPE
031514  000132                                                                  .WORD   L10114-.
031516  012737  000001  002414          MOV     #1,START        ;SEND 1 FLAG
031524  012737  000002  002340          MOV     #2,HEADER       ;SEND 2 HEADER CHARACTERS
031532  013777  002344  150532          MOV     IPCSAR,@PCSAR   ;SET UP PARAMETERS AND ADDRESS
031540  013701  002352                  MOV     LENGTH,R1       ;GET CHARACTER LENGTH
031544  116137  031650  002342          MOVB    CHLEN(R1),IPCR  ;SET UP CHARACTER LENGTH.

031552  012737  000001  002356          MOV     #1,MAINT        ;FLAG TO USE MAINTENANCE MODE LOOPBACK.
031560  012737  000001  002334          MOV     #1,EXERR        ;FLAG THAT AN ERROR IS EXPECTED IN $DATA
031566                                  CALL    $DATA           ;
031572                                  ESCAPE  TST             ;IF ERROR - EXIT
031572  104410                                                                  TRAP    C$ESCAPE
031574  000052                                                                  .WORD   L10114-.

031576  013701  002352                  MOV     LENGTH,R1       ;GET CHARACTER LENGTH
031602  142737  000217  002351          BICB    #217,IRDSR+1    ;CLEAR ALL BUT ABC FROM LAST RDSR.
031610  126137  031661  002351          CMPB    ABC(R1),IRDSR+1 ;IS THE ABC THE EXPECTED VALUE?
031616  001405                          BEQ     10$
031620                                  ERRDF   81,EMG36
031620  104455                                                                  TRAP    C$ERDF
031622  000121                                                                  .WORD   81
031624  015050                                                                  .WORD   EMG36
031626  000000                                                                  .WORD   0
031630  000406                          BR      20$
031632                          10$:
```

```
TEST 19 - ASSEMBLED BIT COUNT
     49 031632  005237  002352                 INC     LENGTH          ;THE NEXT CHARACTER LENGTH
     50 031636  022737  000011  002352         CMP     #9.,LENGTH      ;8 BITS?
     51 031644  001320                         BNE     7$              ;IF NOT - CONTINUE
     52
     53 031646                          20$:
     54
     55
     56 031646                          ENDTST                                          L10114:
        031646                                                                                  TRAP    C$ETST
        031646  104401
     57
     58 031650     000     040     100  CHLEN:  .BYTE   0,40,100,140,200,240,300,340,0
        031653     140     200     240
        031656     300     340     000
     59 031661     000     020     040  ABC:    .BYTE   0,20,40,60,100,120,140,160,0
        031664     060     100     120
        031667     140     160     000
     60                                         .EVEN
     61
```

```
TEST 20 - SPECIAL SPACE SEQUENCING
                                .SBTTL          TEST 20 - SPECIAL SPACE SEQUENCING

                                ;*****************************************************************
                                ;*              TEST 20 - DPV-11
                                ;* SPECIAL SPACE SEQUENCE
                                ;* STARi A MESSAGE USING A SPECIAL SPACE SEQUENCE.  CHECK THAT THE
                                ;* MESSAGE IS CORRECTLY TRANSMITTED AND RECEIVED.
                                ;* NOTE: CERTAIN USYNRTS ONLY TRANSMIT A SPECIAL START SEQUENCE WHEN
                                ;*       TRANSMIT START AND END OF MESSAGE ARE SET BY A BYTE OPERATION.
                                ;*
                                ;*      SELECTED OPTIONS: BOP MODE, CRC-CCITT PRESET TO 1,
                                ;*                        5 BIT CHARACTERS, MAINTENANCE MODE LOOPBACK.
                                ;*
                                ;*****************************************************************
 031672                         BGNTST
 031672                                                                          T20::

 031672                                 CALL    $RESET          ;RESET THE DPV
 031676                                 ESCAPE  TST             ;IF ERROR, BR TO THE END.
 031676  104410                                                                 TRAP    C$ESCAPE
 031700  000136                                                                 .WORD   L10115-.
 031702  012737  100000  002362        MOV     #BOP,MODE       ;FLAG THAT WE ARE IN BOP MODE.
 031710  012737  000000  002344        MOV     #CCITT1,IPCSAR  ;SET CRC-CCITT PRESET TO ONE
 031716  012737  000002  002414        MOV     #2,START        ;SEND 1 FLAG
 031724  012737  000002  002340        MOV     #2,HEADER       ;SEND 2 HEADER CHARACTERS
 031732  012737  000005  002352        MOV     #5,LENGTH       ;CHARACTER LENGTH OF 5 BITS.
 031740  012737  000003  002434        MOV     #3,TSTART       ;SET TSOM AND TEOM IN BYTE MODE.
 031746  012737  001000  002422        MOV     #TEOM,TEND      ;END OF MESSAGE
 031754  012737  002502  002470        MOV     #$CCITT,XTYPE   ;USE CCITT DATA PATTERN
 031762  012737  000100  002472        MOV     #64.,XCOUNT     ;# OF CHARACTERS TO TRANSMIT
                                                                ;
 031770  013777  002344  150274        MOV     IPCSAR,@PCSAR   ;SET UP PARAMETERS AND ADDRESS
 031776  112737  000245  002342        MOVB    #245,IPCR       ;SET UP CHARACTER LENGTH

 032004                                 CALL    $BUFRS          ;SET UP TRANSMIT AND RECEIVE BUFFERS.
 032010  012737  000001  002356        MOV     #1,MAINT        ;FLAG TO USE MAINTENANCE MODE LOOPBACK.
 032016  005037  002334                CLR     EXERR           ;FLAG THAT NO ERRORS ARE EXPECTED IN $DATA
 032022                                 CALL    $DATA           ;
 032026                                 ESCAPE  TST             ;IF ERROR, ESCAPE TEST
 032026  104410                                                                 TRAP    C$ESCAPE
 032030  000006                                                                 .WORD   L10115-.

 032032                                 CALL    $CHECK          ;CHECK THAT THE DATA WAS CORRECT.
 032036                         20$:

 032036                         ENDTST
 032036                                                                  L10115:
 032036  104401                                                                 TRAP    C$ETST
```

```
                                .SBTTL          TEST 21 - SYNCH CHARACTER

                                ;*****************************************************************************
                                ;*              TEST 21 - DPV-11
                                ;* SYNCH CHARACTER
                                ;* CHECK THAT A SYNCH CHARACTER OF 271 CAN BE USED TO COMMENCE A MESSAGE.
                                ;* VERIFY THAT THE MESSAGE IS CORRECTLY TRANSMITTED AND RECEIVED.
                                ;*      SELECTED OPTIONS: BCP MODE, VRC-EVEN PARITY,
                                ;*                        7 BIT CHARACTERS, MAINTENANCE MODE LOOPBACK.
                                ;*
                                ;*****************************************************************************
 032040                         BGNTST
 032040                                                                          T21::

 032040                                 CALL    $RESET          ;RESET THE DPV
 032044                                 ESCAPE  TST             ;IF ERROR, BR TO THE END.
 032044 104410                                                                   TRAP    C$ESCAPE
 032046 000154                                                                   .WORD   L10116-.
 032050 005037 002362                   CLR     MODE            ;FLAG THAT WE ARE IN BCP MODE.
 032054 012737 002400 002344            MOV     #VRCE,IPCSAR    ;SET VRC EVEN
 032062 112737 000271 002344            MOVB    #271,IPCSAR     ;SYNCH CHARACTER
 032070 052737 040000 002344            BIS     #PROTO,IPCSAR   ;SET BCP PROTOCOL
 032076 012737 000002 002414            MOV     #2,STARI        ;SEND 2 FLAGS
 032104 012737 000001 002340            MOV     #1,HEADER       ;SEND 1 HEADER CHARACTER
 032112 012737 000007 002352            MOV     #7,LENGTH       ;CHARACTER LENGTH OF 7 BITS.
 032120 012737 000400 002434            MOV     #TSOM,TSTART    ;START OF MESSAGE.
 032126 012737 001000 002422            MOV     #TEOM,TEND      ;END OF MESSAGE
 032134 012737 002502 002470            MOV     #$CCITT,XTYPE   ;USE CCITT DATA PATTERN
 032142 012737 000017 002472            MOV     #15.,XCOUNT     ;# OF CHARACTERS TO TRANSMIT
                                                                ;

 032150 112737 000347 002342            MOVB    #347,IPCR       ;CHARACTER LENGTH
 032156 013777 002344 150106            MOV     IPCSAR,@PCSAR   ;SET UP PARAMETERS AND ADDRESS
 032164 113777 002342 150112            MOVB    IPCR,@PCR       ;SET UP CHARACTER LENGTH

 032172                                 CALL    $BUFRS          ;SET UP TRANSMIT AND RECEIVE BUFFERS.
 032176 012737 000001 002356            MOV     #1,MAINT        ;FLAG TO USE MAINTENANCE MODE LOOPBACK.
 032204 005037 002334                   CLR     EXERR           ;FLAG THAT NO ERRORS ARE EXPECTED IN $DATA
 032210                                 CALL    $DATA           ;
 032214 103402                          BCS     20$             ;IF ERROR SKIP DATA CHECK.

 032216                                 CALL    $CHECK          ;CHECK THAT THE DATA WAS CORRECT.
 032222                         20$:

                                ENDTST
 032222                                                                  L10116:
 032222 104401                                                                  TRAP    C$ETST
```

TEST 22 - SYNCH FROM TRANSMIT DATA PATH

```
                                .SBTTL          TEST 22 - SYNCH FROM TRANSMIT DATA PATH

                                ;*****************************************************************************
                                ;*                      TEST 22 - DPV-11
                                ;* SYNCH FROM TRANSMIT DATA PATH
                                ;* TRANSMIT A MESSAGE USING THE SYNCH FROM THE TRANSMIT DATA PATH.
                                ;* VERIFY THAT THE MESSAGE IS CORRECTLY TRANSMITTED AND RECEIVED.
                                ;*      SELECTED OPTIONS: BCP MODE, VRC-ODD PARITY, IDLE SET
                                ;*                        5 BIT CHARACTERS, MAINTENANCE MODE LOOPBACK.
                                ;*
                                ;*****************************************************************************
 032224                         BGNTST
 032224                                                                          T22::
 032224                                 CALL    $RESET          ;RESET THE DPV
 032230                                 ESCAPE  TST             ;IF ERROR, BR TO THE END.
 032230  104410                                                                 TRAP    C$ESCAPE
 032232  000154                                                                 .WORD   L10117-.
 032234  005037  002362                 CLR     MODE            ;FLAG THAT WE ARE IN BCP MODE.
 032240  012737  002000  002344         MOV     #VRCO,IPCSAR    ;VRC ODD
 032246  052737  040000  002344         BIS     #PROTO,IPCSAR   ;SET BCP PROTOCOL
 032254  052737  004000  002344         BIS     #IDLE,IPCSAR    ;SET THE IDLE BIT
 032262  012737  000002  002414         MOV     #2,START        ;SEND 2 SYNCHS
 032270  012737  000001  002340         MOV     #1,HEADER       ;SEND 1 HEADER CHARACTER
 032276  012737  000005  002352         MOV     #5,LENGTH       ;CHARACTER LENGTH OF 5 BITS.
 032304  012737  000400  002434         MOV     #TSOM,TSTART    ;START OF MESSAGE.
 032312  012737  001000  002422         MOV     #TEOM,TEND      ;END OF MESSAGE
 032320  012737  002502  002470         MOV     #$CCITT,XTYPE   ;USE CCITT DATA PATTERN
 032326  012737  000021  002472         MOV     #17.,XCOUNT     ;# OF CHARACTERS TO TRANSMIT
                                                                ;
 032334  112737  000245  002342         MOVB    #245,IPCR       ;CHARACTER LENGTH
 032342  113777  002342  147734         MOVB    IPCR,@PCR       ;SET UP CHARACTER LENGTH
 032350  013777  002344  147714         MOV     IPCSAR,@PCSAR   ;SET UP PARAMETERS AND ADDRESS

 032356                                 CALL    $BUFRS          ;SET UP TRANSMIT AND RECEIVE BUFFERS.
 032362  012737  000001  002356         MOV     #1,MAINT        ;FLAG TO USE MAINTENANCE MODE LOOPBACK.
 032370  005037  002334                 CLR     EXERR           ;FLAG THAT NO ERRORS ARE EXPECTED IN $DATA
 032374                                 CALL    $DATA           ;
 032400  103402                        BCS     20$             ;IF ERROR SKIP DATA CHECK.

 032402                                 CALL    $CHECK          ;CHECK THAT THE DATA WAS CORRECT.
 032406                         20$:

                                ENDTST
 032406                                                                  L10117:
 032406  104401                                                                 TRAP    C$ETST
```

TEST 23 - STRIP SYNCHS

```
                                .SBTTL          TEST 23 - STRIP SYNCHS

                                ;*****************************************************************************
                                ;*                      TEST 23 - DPV-11
                                ;* STRIP SYNCHS
                                ;* SEND MORE THAN 2 SYNCHS WITH THE STRIP SYNCH BIT SET. CHECK THAT
                                ;* THE MESSAGE IS CORRECTLY TRANSMITTED AND RECEIVED.
                                ;*      SELECTED OPTIONS: BCP MODE, VRC-ODD PARITY, STRIP SYNCH SET
                                ;*                        6 BIT CHARACTERS, MAINTENANCE MODE LOOPBACK.
                                ;*
                                ;*****************************************************************************
032410                          BGNTST
032410                                                                                  T23::

032410                                  CALL    $RESET          ;RESET THE DPV
032414                                  ESCAPE  TST             ;IF ERROR, BR TO THE END.
032414  104410                                                                          TRAP    C$ESCAPE
032416  000154                                                                          .WORD   L10120-.
032420  005037  002362                  CLR     MODE            ;FLAG THAT WE ARE IN BCP MODE.
032424  012737  002000  002344          MOV     #VRCO,IPCSAR    ;VRC ODD
032432  052737  020014  002344          BIS     #SSYNCH!14,IPCSAR ;SYNCH + STRIP SYNCHS
032440  052737  040000  002344          BIS     #PROTO,IPCSAR   ;SET BCP PROTOCOL
032446  012737  000010  002414          MOV     #8.,START       ;SEND 8 SYNCHS
032454  012737  000001  002340          MOV     #1,HEADER       ;SEND 1 HEADER CHARACTER
032462  012737  000006  002352          MOV     #6,LENGTH       ;CHARACTER LENGTH OF 5 BITS.
032470  012737  000400  002434          MOV     #TSOM,TSTART    ;START OF MESSAGE.
032476  012737  001000  002422          MOV     #TEOM,TEND      ;END OF MESSAGE
032504  012737  002502  002470          MOV     #$CCITT,XTYPE   ;USE CCITT DATA PATTERN
032512  012737  000015  002472          MOV     #13.,XCOUNT     ;# OF CHARACTERS TO TRANSMIT
                                                                ;
032520  112737  000306  002342          MOVB    #306,IPCR       ;CHARACTER LENGTH
032526  113777  002342  147550          MOVB    IPCR,@PCR       ;SET UP CHARACTER LENGTH
032534  013777  002344  147530          MOV     IPCSAR,@PCSAR   ;SET UP PARAMETERS AND ADDRESS

032542                                  CALL    $BUFRS          ;SET UP TRANSMIT AND RECEIVE BUFFERS.
032546  012737  000001  002356          MOV     #1,MAINT        ;FLAG TO USE MAINTENANCE MODE LOOPBACK.
032554  005037  002334                  CLR     EXERR           ;FLAG THAT NO ERRORS ARE EXPECTED IN $DATA
032560                                  CALL    $DATA           ;
032564  103402                          BCS     20$             ;IF ERROR SKIP DATA CHECK.

032566                                  CALL    $CHECK          ;CHECK THAT THE DATA WAS CORRECT.
032572                          20$:

032572                          ENDTST
032572                                                                          L10120:
032572  104401                                                                          TRAP    C$ETST
```

```
CVDPVA0 DPV11 FUNC DIAG MACRO V03.01 17-JUN-80 16:09:09 PAGE 81                SEQ  174
TEST 24 - CRC-CCITT PRESET TO ONES
                                .SBTTL          TEST 24 - CRC-CCITT PRESET TO ONES

                                ;*****************************************************************
                                ;*              TEST 24 - DPV-11
                                ;* CRC-CCITT PRESET TO ONES.
                                ;* CHECK TO ENSURE THAT THE ERROR CHECK BIT (BIT 15 OF RDSR) IS
                                ;* SET WHEN AN ABORT IS RECEIVED.  IN BOP MODE THIS BIT IS SET WHEN THE
                                ;* CRC IS IN ERROR.  THE ERROR CHECK BIT SHOULD BE ZERO WHEN REOM=1,
                                ;* IF THE CRC WERE CORRECTLY RECEIVED. BY FORCING AN ABORT WE INTENTIONALLY
                                ;* LOOK AT THE ERROR BIT WHEN IT SHOULD BE IN AN ERROR STATE.
                                ;*      SELECTED OPTIONS: BOP MODE, CRC-CCITT PRESET TO 1, LOOP SET,
                                ;*                        4 BIT CHARACTERS, MAINTENANCE MODE LOOPBACK.
                                ;*
                                ;*****************************************************************
032574                          BGNTST
032574                                                                  T24::

                                        CALL    $RESET          ;RESET THE DPV
                                        ESCAPE  TST             ;IF ERROR, BR TO THE END.
032600  104410                                                                  TRAP    C$ESCAPE
032602  000160                                                                  .WORD   L10121-.
032604  012737  100000  002362          MOV     #BOP,MODE       ;FLAG THAT WE ARE IN BOP MODE.
032612  012737  000000  002344          MOV     #CCITT1,IPCSAR  ;SET CRC-CCITT PRESET TO ONE
032620  052737  020000  002344          BIS     #LOOP,IPCSAR    ;SET LOOP MODE TO RECOGNIZE GO AHEAD.
032626  012737  000001  002414          MOV     #1,START        ;SEND 1 FLAG
032634  012737  000002  002340          MOV     #2,HEADER       ;SEND 2 HEADER CHARACTERS
032642  012737  000004  002352          MOV     #4,LENGTH       ;CHARACTER LENGTH OF 5 BITS.
032650  012737  000400  002434          MOV     #TSOM,TSTART    ;START MESSAGE
032656  012737  002000  002422          MOV     #TXABO,TEND     ;ABORT MESSAGE
032664  012737  002502  002470          MOV     #$CCITT,XTYPE   ;USE CCITT DATA PATTERN
032672  012737  000100  002472          MOV     #64.,XCOUNT     ;# OF CHARACTERS TO TRANSMIT
                                                                ;
032700  013777  002344  147364          MOV     IPCSAR,@PCSAR   ;SET UP PARAMETERS AND ADDRESS
032706  112737  000204  002342          MOVB    #204,IPCR       ;SET UP CHARACTER LENGTH


032714                                  CALL    $BUFRS          ;SET UP TRANSMIT AND RECEIVE BUFFERS.
032720  012737  000001  002356          MOV     #1,MAINT        ;FLAG TO USE MAINTENANCE MODE LOOPBACK.
032726  012737  000001  002334          MOV     #1,EXERR        ;FLAG THAT AN ERROR IS EXPECTED IN $DATA
032734                                  CALL    $DATA           ;
032740                                  ESCAPE  TST             ;IF ERROR - EXIT TEST
032740  104410                                                                  TRAP    C$ESCAPE
032742  000020                                                                  .WORD   L10121-.
032744  005737  002350                  TST     IRDSR           ;IS THE ERR BIT SET
032750  100404                          BMI     20$             ;IF YES - OK
032752                                  ERRDF   82,EMG38
032752  104455                                                                  TRAP    C$ERDF
032754  000122                                                                  .WORD   82
032756  015114                                                                  .WORD   EMG38
032760  000000                                                                  .WORD   0
032762                          20$:

032762                          ENDTST
032762                                                                  L10121:
032762  104401                                                                  TRAP    C$ETST

```

TEST 25 - CRC-CCITT PRESET TO ZERO

```
                                .SBTTL          TEST 25 - CRC-CCITT PRESET TO ZERO

                                ;*****************************************************************
                                ;*              TEST 25 - DPV-11
                                ;* CRC-CCITT PRESET TO ZERO.
                                ;* CHECK TO ENSURE THAT THE ERROR CHECK BIT (BIT 15 OF RDSR) IS
                                ;* SET WHEN AN ABORT IS RECEIVED.  IN BOP MODE THIS BIT IS SET WHEN THE
                                ;* CRC IS IN ERROR.  THE ERROR CHECK BIT SHOULD BE ZERO WHEN REQM=1,
                                ;* IF THE CRC WERE CORRECTLY RECEIVED. BY FORCING AN ABORT WE INTENTIONALLY
                                ;* LOOK AT THE ERROR BIT WHEN IT SHOULD BE IN AN ERROR STATE.
                                ;*      SELECTED OPTIONS: BOP MODE, CRC-CCITT PRESET TO 0, LOOP SET,
                                ;*                        8 BIT CHARACTERS, MAINTENANCE MODE LOOPBACK.
                                ;*
                                ;*****************************************************************
 032764                         BGNTST
 032764                                                                          T25::

                                        CALL    $RESET          ;RESET THE DPV
 032770                                 ESCAPE  TST             ;IF ERROR, BR TO THE END.
 032770 104410                                                                  TRAP    C$ESCAPE
 032772 000156                                                                  .WORD   L10122-.
 032774 012737 100000 002362            MOV     #BOP,MODE       ;FLAG THAT WE ARE IN BOP MODE.
 033002 012737 000400 002344            MOV     #CCITTO,IPCSAR  ;SET CRC-CCITT PRESET TO ZERO
 033010 052737 020000 002344            BIS     #LOOP,IPCSAR    ;SET LOOP MODE TO RECOGNIZE GO AHEAD.
 033016 012737 000001 002414            MOV     #1,START        ;SEND 1 FLAG
 033024 012737 000002 002340            MOV     #2,HEADER       ;SEND 2 HEADER CHARACTERS
 033032 012737 000010 002352            MOV     #8.,LENGTH      ;CHARACTER LENGTH OF 8 BITS.
 033040 012737 000400 002434            MOV     #TSOM,TSTART    ;START MESSAGE
 033046 012737 002000 002422            MOV     #TXABO,TEND     ;ABORT MESSAGE
 033054 012737 002502 002470            MOV     #$CCITT,XTYPE   ;USE CCITT DATA PATTERN
 033062 012737 000100 002472            MOV     #64.,XCOUNT     ;# OF CHARACTERS TO TRANSMIT
                                                                ;
 033070 013777 002344 147174            MOV     IPCSAR,@PCSAR   ;SET UP PARAMETERS AND ADDRESS
 033076 105037 002342                   CLRB    IPCR            ;SET UP CHARACTER LENGTH

 033102                                 CALL    $BUFRS          ;SET UP TRANSMIT AND RECEIVE BUFFERS.
 033106 012737 000001 002356            MOV     #1,MAINT        ;FLAG TO USE MAINTENANCE MODE LOOPBACK.
 033114 012737 000001 002334            MOV     #1,EXERR        ;FLAG THAT AN ERROR IS EXPECTED IN $DATA
 033122                                 CALL    $DATA           ;
 033126                                 ESCAPE  TST             ;IF ERROR - EXIT TEST
 033126 104410                                                                  TRAP    C$ESCAPE
 033130 000020                                                                  .WORD   L10122-.
 033132 005737 002350                   TST     IRDSR           ;IS THE ERR BIT SET
 033136 100404                          BMI     20$             ;IF YES - OK
 033140                                 ERRDF   83,EMG38
 033140 104455                                                                  TRAP    C$ERDF
 033142 000123                                                                  .WORD   83
 033144 015114                                                                  .WORD   EMG38
 033146 000000                                                                  .WORD   0
 033150                         20$:

 033150                         ENDTST
 033150                                                                 L10122:
 033150 104401                                                                  TRAP    C$ETST
```

```
TEST 25 - CRC-CCITT PRESET TO ZERO
      47
      48
      49
```

```
CVDPVA0 DPV11 FUNC DIAG MACRO V03.01 17-JUN-80 16:09:09 PAGE 84                SEQ  177
TEST 26 - CRC-16 PRESET TO 0
      1                                 .SBTTL          TEST 26 - CRC-16 PRESET TO 0
      2
      3                                 ;*********************************************************************
      4                                 ;*              TEST 26 - DPV-11
      5                                 ;* CRC-16 PRESET TO 0
      6                                 ;*
      7                                 ;* SUBTEST 1 - CRC-16 ERROR
      8                                 ;* CHECK TO ENSURE THAT THE ERROR CHECK BIT (BIT 15 OF RDSR) IS
      9                                 ;* CLEAR IF THE RECEIVER IS SHUTDOWN BEFORE THE CRC IS RECEIVED.
     10                                 ;* IN BCP MODE THIS BIT IS CLEAR WHEN THE CRC IS IN ERROR.
     11                                 ;* THE ERROR CHECK BIT SHOULD BE SET WHEN THE LAST CHARACTER IS RECEIVED,
     12                                 ;* IF THE CRC WERE GOOD.
     13                                 ;*      SELECTED OPTIONS: BCP MODE, CRC-16 PRESET TO 0, LOOP SET,
     14                                 ;*                        8 BIT CHARACTERS, MAINTENANCE MODE LOOPBACK.
     15                                 ;*
     16                                 ;* SUBTEST 2 -  CRC-16 CHECK
     17                                 ;* CHECK THAT THE CORRECT CRC-16 IS RECEIVED FOR THE DATA MESSAGE.
     18                                 ;* THE CRC FOR THIS DATA MESSAGE WAS PREDETERMINED.
     19                                 ;*
     20                                 ;*********************************************************************
     21 033152                          BGNTST
        033152                                                                  T26::
     22
     23 033152                           BGNSUB
        033152                                                                  T26.1:
        033152  104402                                                                 TRAP    C$BSUB
     24 033154                                  CALL    $RESET          ;RESET THE DPV
     25 033160                                  ESCAPE  TST             ;IF ERROR, BR TO THE END.
        033160  104410                                                          TRAP    C$ESCAPE
        033162  000404                                                          .WORD   L10123-.
     26 033164  005037  002362                  CLR     MODE            ;FLAG THAT WE ARE IN BCP MODE.
     27 033170  012737  001400  002344          MOV     #CRC16,IPCSAR   ;SET CRC 16
     28 033176  112737  000271  00234?          MOVB    #271,IPCSAR     ;SYNCH CHARACTER
     29 033204  052737  040000  002344          BIS     #PROTO,IPCSAR   ;SET BCP PROTOCOL
     30 033212  012737  000002  002414          MOV     #2,START        ;SEND 2 SYNCHS
     31 033220  012737  000001  002340          MOV     #1,HEADER       ;SEND 1 HEADER CHARACTER
     32 033226  012737  000010  002352          MOV     #8.,LENGTH      ;CHARACTER LENGTH OF 8 BITS.
     33 033234  012737  000400  002434          MOV     #TSOM,TSTART    ;START OF MESSAGE.
     34 033242  012737  001000  002422          MOV     #TEOM,TEND      ;END OF MESSAGE
     35 033250  012737  002502  002470          MOV     #$CCITT,XTYPE   ;USE CCITT DATA PATTERN
     36 033256  012737  000017  002472          MOV     #15.,XCOUNT     ;# OF CHARACTERS TO TRANSMIT
     37                                         ;
     38 033264  105037  002342                  CLRB    IPCR            ;CHARACTER LENGTH.
     39 033270  013777  002344  146774          MOV     IPCSAR,@PCSAR   ;SET UP PARAMETERS AND ADDRESS
     40
     41
     42 033276                                  CALL    $BUFRS          ;SET UP TRANSMIT AND RECEIVE BUFFERS.
     43 033302  012737  000001  002356          MOV     #1,MAINT        ;FLAG TO USE MAINTENANCE MODE LOOPBACK.
     44 033310  005037  002334                  CLR     EXERR           ;FLAG THAT NO ERRORS ARE EXPECTED IN $DATA
     45 033314  005337  002474                  DEC     ECOUNT          ;CHANGE THE END COUNT
     46 033320                                  CALL    $DATA           ;
     47 033324                                  ESCAPE  TST             ;IF ERROR - EXIT TEST
        033324  104410                                                          TRAP    C$ESCAPE
        033326  000240                                                          .WORD   L10123-.
     48 033330  005737  0?2?2?                  TST     IRDSR           ;IS THE ERR BIT SET
     49 033334  100004                          BPL     20$             ;IF YES - OK
     50 033336                                  ERRDF   84,EMG38
```

```
TEST 26 - CRC-16 PRESET TO 0
        033336  104455                                                          TRAP    C$ERDF
        033340  000124                                                          .WORD   84
        033342  015114                                                          .WORD   EMG38
        033344  000000                                                          .WORD   0
     51 033346                          20$:
     52 033346                            ENDSUB
        033346                                                          L10124:
        033346  104403                                                          TRAP    C$ESUB
     53
     54 033350                          BGNSUB
        033350                                                          T26.2:
        033350  104402                                                          TRAP    C$BSUB
     55 033352                                CALL    $RESET          ;RESET THE DPV
     56 033356                                ESCAPE  TST             ;IF ERROR, BR TO THE END.
        033356  104410                                                          TRAP    C$ESCAPE
        033360  000206                                                          .WORD   L10123-.
     57 033362  005037  002362                CLR     MODE            ;FLAG THAT WE ARE IN BCP MODE.
     58 033366  012737  001400  002344        MOV     #CRC16,IPCSAR   ;SET VRC EVEN
     59 033374  112737  000271  002344        MOVB    #271,IPCSAR     ;SYNCH CHARACTER
     60 033402  052737  040000  002344        BIS     #PROTO,IPCSAR   ;SET BCP PROTOCOL
     61 033410  012737  000002  002414        MOV     #2,START        ;SEND 2 SYNCHS
     62 033416  012737  000001  002340        MOV     #1,HEADER       ;SEND 1 HEADER CHARACTER
     63 033424  012737  000010  002352        MOV     #8.,LENGTH      ;CHARACTER LENGTH OF 8 BITS.
     64 033432  012737  000400  002434        MOV     #TSOM,TSTART    ;START OF MESSAGE.
     65 033440  012737  001000  002422        MOV     #TEOM,TEND      ;END OF MESSAGE
     66 033446  012737  002502  002470        MOV     #$CCITT,XTYPE   ;USE CCITT DATA PATTERN
     67 033454  012737  000017  002472        MOV     #15.,XCOUNT     ;# OF CHARACTERS TO TRANSMIT
     68                                                              ;
     69 033462  013777  002344  146602        MOV     IPCSAR,@PCSAR   ;SET UP PARAMETERS AND ADDRESS
     70 033470  105037  002342                CLRB    IPCR            ;SET UP CHARACTER LENGTH
     71
     72 033474                                CALL    $BUFRS          ;SET UP TRANSMIT AND RECEIVE BUFFERS.
     73
     74 033500  012737  000001  002356        MOV     #1,MAINT        ;FLAG TO USE MAINTENANCE MODE LOOPBACK.
     75 033506  005037  002334                CLR     EXERR           ;FLAG THAT NO ERRORS ARE EXPECTED IN $DATA
     76
     77 033512  062737  000002  002474        ADD     #2,ECOUNT       ;CHANGE END COUNT TO GET CRC
     78
     79 033520                                CALL    $DATA           ;
     80 033524                                ESCAPE  TST             ;IF ERROR - EXIT TEST
        033524  104410                                                          TRAP    C$ESCAPE
        033526  000040                                                          .WORD   L10123-.
     81 033530  012701  003273                MOV     #RCVBUF,R1      ;ADDRESS OF RECEIVE BUFFER
     82 033534  063701  002472                ADD     XCOUNT,R1       ;CALCULATE ADDRESS OF CRC
     83 033540  122127  000332                CMPB    (R1)+,#CRCLO    ;CHECK LO BYTE OF THE CRC
     84 033544  001003                        BNE     10$             ;IF ERROR - REPORT
     85 033546  122127  000266                CMPB    (R1)+,#CRCHI    ;CHECK HI BYTE OF THE CRC
     86 033552  001404                        BEQ     20$             ;IF NOT ERROR - OK
     87 033554                          10$:
     88 033554                                ERRDF   85,EMG37        ;CRC ERROR.
        033554  104455                                                          TRAP    C$ERDF
        033556  000125                                                          .WORD   85
        033560  015102                                                          .WORD   EMG37
        033562  000000                                                          .WORD   0
     89 033564                          20$:
     90 033564                            ENDSUB
        033564                                                          L10125:
```

TEST 26 - CRC-16 PRESET TO 0

```
            033564  104403                                          TRAP    C$ESUB
     91
     92     033566                          ENDTST
            033566                                          L10123:
            033566  104401                                          TRAP    C$ETST
     93
     94
     95
```

```
                                .SBTTL          TEST 27 - VRC ODD PARITY ERROR

                                ;*****************************************************************************
                                ;*              TEST 27 - DPV-11
                                ;* VRC ODD PARITY ERROR
                                ;* BY SELECTING DIFFERENT CHARACTER LENGTHS IN THE RECEIVER AND
                                ;* TRANSMITTER, CAUSE A PARITY ERROR TO OCCUR.
                                ;*      SELECTED OPTIONS: BCP MODE, VRC-ODD PARITY, XMIT=7 &
                                ;*                        RCV=6 BIT CHARACTERS, MAINTENANCE MODE LOOPBACK.
                                ;*
                                ;*****************************************************************************
033570                          BGNTST
033570                                                                          T27::

                                        CALL    $RESET          ;RESET THE DPV
033574                                  ESCAPE  TST             ;IF ERROR, BR TO THE END.
033574  104410                                                                  TRAP    C$ESCAPE
033576  000160                                                                  .WORD   L10126-.
033600  005037  002362                  CLR     MODE            ;FLAG THAT WE ARE IN BCP MODE.
033604  012737  002000  002344          MOV     #VRC0,IPCSAR    ;SET VRC ODD
033612  112737  000271  002344          MOVB    #271,IPCSAR     ;SYNCH CHARACTER
033620  052737  040000  002344          BIS     #PROTO,IPCSAR   ;SET BCP PROTOCOL
033626  012737  000002  002414          MOV     #2,START        ;SEND 2 SYNCHS
033634  012737  000002  002340          MOV     #2,HEADER       ;SEND 2 HEADER CHARACTERS
033642  012737  000010  002352          MOV     #8.,LENGTH      ;CHARACTER LENGTH OF 8 BITS.
033650  012737  000400  002434          MOV     #TSOM,TSTART    ;START OF MESSAGE.
033656  012737  001000  002422          MOV     #TEOM,TEND      ;END OF MESSAGE
033664  012737  002502  002470          MOV     #$CCITT,XTYPE   ;USE CCITT DATA PATTERN
033672  012737  000017  002472          MOV     #15.,XCOUNT     ;# OF CHARACTERS TO TRANSMIT
                                                                ;
033700  112737  000346  002342          MOVB    #346,IPCR       ;SET UP A XMIT CHARACTER = 7
                                                                ;AND A RECEIVE CHARACTER = 6
033706  013777  002344  146356          MOV     IPCSAR,@PCSAR   ;SET UP PARAMETERS AND ADDRESS


033714                                  CALL    $BUFRS          ;SET UP TRANSMIT AND RECEIVE BUFFERS.
033720  012737  000001  002356          MOV     #1,MAINT        ;FLAG TO USE MAINTENANCE MODE LOOPBACK.
033726  012737  000001  002334          MOV     #1,EXERR        ;FLAG THAT AN ERROR IS EXPECTED IN $DATA
033734                                  CALL    $DATA           ;
033740  005737  002350                  TST     IRDSR           ;IS THE ERROR BIT SET (BIT 15)?
033744  100404                          BMI     20$             ;IF SET OK
033746                                  ERRDF   86,EMG39
033746  104455                                                                  TRAP    C$ERDF
033750  000126                                                                  .WORD   86
033752  015143                                                                  .WORD   EMG39
033754  000000                                                                  .WORD   0
033756                          20$:


033756                          ENDTST
033756                                                                  L10126:
033756  104401                                                                  TRAP    C$ETST
```

```
TEST 28 - VRC EVEN PARITY ERROR
                                .SBTTL          TEST 28 - VRC EVEN PARITY ERROR
                                ;*****************************************************************************
                                ;*              TEST 28 - DPV-11
                                ;* VRC EVEN PARITY ERROR
                                ;* BY SELECTING DIFFERENT CHARACTER LENGTHS IN THE RECEIVER AND
                                ;* TRANSMITTER, CAUSE A PARITY ERROR TO OCCUR.
                                ;*      SELECTED OPTIONS: BCP MODE, VRC-EVEN PARITY, XMIT=5 &
                                ;*                        RCV=4 BIT CHARACTERS, MAINTENANCE MODE LOOPBACK.
                                ;*
                                ;*****************************************************************************
033760                          BGNTST
033760                                                                          T28::

033760                                  CALL    $RESET          ;RESET THE DPV
033764                                  ESCAPE  TST             ;IF ERROR, BR TO THE END.
033764  104410                                                                  TRAP    C$ESCAPE
033766  000160                                                                  .WORD   L10127-.
033770  005037  002362                  CLR     MODE            ;FLAG THAT WE ARE IN BCP MODE.
033774  012737  002400  002344          MOV     #VRCE,IPCSAR    ;SET VRC EVEN
034002  112737  000271  002344          MOVB    #271,IPCSAR     ;SYNCH CHARACTER
034010  052737  040000  002344          BIS     #PROTO,IPCSAR   ;SET BCP PROTOCOL
034016  012737  000002  002414          MOV     #2,START        ;SEND 2 SYNCHS
034024  012737  000002  002340          MOV     #2,HEADER       ;SEND 2 HEADER CHARACTERS
034032  012737  000010  002352          MOV     #8.,LENGTH      ;CHARACTER LENGTH OF 8 BITS.
034040  012737  000400  002434          MOV     #TSOM,TSTART    ;START OF MESSAGE.
034046  012737  001000  002422          MOV     #TEOM,TEND      ;END OF MESSAGE
034054  012737  002502  002470          MOV     #$CCITT,XTYPE   ;USE CCITT DATA PATTERN
034062  012737  000017  002472          MOV     #15.,XCOUNT     ;# OF CHARACTERS TO TRANSMIT
                                                                ;
034070  112737  000244  002342          MOVB    #244,IPCR       ;SET UP A XMIT CHARACTER = 5
                                                                ;AND A RECEIVE CHARACTER = 4
034076  013777  002344  146166          MOV     IPCSAR,@PCSAR   ;SET UP PARAMETERS AND ADDRESS


034104                                  CALL    $BUFRS          ;SET UP TRANSMIT AND RECEIVE BUFFERS.
034110  012737  000001  002356          MOV     #1,MAINT        ;FLAG TO USE MAINTENANCE MODE LOOPBACK.
034116  012737  000001  002334          MOV     #1,EXERR        ;FLAG THAT AN ERROR IS EXPECTED IN $DATA
034124                                  CALL    $DATA           ;
034130  005737  002350                  TST     IRDSR           ;IS THE ERROR BIT SET (BIT 15)?
034134  100404                          BMI     20$             ;IF SET OK
034136                                  ERRDF   87,EMG39
034136  104455                                                                  TRAP    C$ERDF
034140  000127                                                                  .WORD   87
034142  015143                                                                  .WORD   EMG39
034144  000000                                                                  .WORD   0
034146                          20$:

034146                          ENDTST
034146                                                                  L10127:
034146  104401                                                                  TRAP    C$ETST
```

```
TEST 29 - DATA TEST
                                .SBTTL          TEST 29 - DATA TEST
                                ;*****************************************************************************
                                ;*              TEST 29 - DPV-11
                                ;* DATA TEST
                                ;* TRANSMIT AND RECEIVE A COMPLETE DATA MESSAGE WITHOUT THE USE OF INTERRUPT
                                ;* SERVICE ROUTINES. CHECK THAT THE DATA IS  CORRECT.
                                ;*      SELECTED OPTIONS: BOP MODE, CRC-CCITT PRESET TO ONES,
                                ;*                        8 BIT CHARACTERS, MAINTENANCE MODE LOOPBACK.
                                ;*
                                ;*****************************************************************************
034150                          BGNTST
                                                                                        T29::
034150                                  CALL    $SPEED          ;CAN THE CPU SUPPORT THE LOOPBACK?
034154  103573                          BCS     50$             ;IF NOT, SKIP THE TEST.
034156                                  CALL    $RESET          ;RESET THE DPV
034162                                  ESCAPE  TST             ;IF ERROR, BR TO THE END.
034162  104410                                                                          TRAP    C$ESCAPE
034164  000360                                                                          .WORD   L10130-.
034166  012737  100000  002362                  MOV     #BOP,MODE       ;FLAG THAT MODE IS BOP.
034174  005037  002344                          CLR     IPCSAR          ;IMAGE OF PCSAR = 0.
034200  012737  000000  002344                  MOV     #CCITT1,IPCSAR  ;SET CRC-CCITT PRESET TO ONE
034206  012737  000010  002352                  MOV     #8.,LENGTH      ;CHARACTER LENGTH OF 8 BITS
034214  012737  002602  002470                  MOV     #ALPHA,XTYPE    ;USE ALPHANUMERIC DATA PATTERN
034222  012737  000045  002472                  MOV     #ACOUNT,XCOUNT  ;# OF CHARACTERS TO TRANSMIT
                                                                        ;
034230                                  CALL    $BUFRS          ;SET UP TRANSMIT AND RECEIVE BUFFERS.
034234  012701  003273                  MOV     #RCVBUF,R1      ;RECEIVE BUFFER
034240  012702  002673                  MOV     #XMTBUF,R2      ;TRANSMIT BUFFER
034244  013703  002472                  MOV     XCOUNT,R3       ;TRANSMIT COUNT
034250  005037  002500                  CLR     RCOUNT          ;CLEAR THE RECEIVE COUNTER.
034254  013704  002430                  MOV     TIMER,R4        ;SET UP THE TIMER.
034260  013777  002402  146002          MOV     RXINI,@RXCSR    ;ENABLE THE RECEIVER
034266  013777  002436  146000          MOV     TXINI,@TXCSR    ;ENABLE THE RECEIVER
034274  012777  000400  145774          MOV     #TSOM,@TDSR     ;TRANSMIT START OF MESSAGE
034302                          9$:
034302  005005                          CLR     R5              ;INNER TIMER LOOP COUNTER.
034304                          10$:
034304  005777  145766                  TST     @TDSR           ;IS THERE A TRANSMIT ERROR?
034310  100005                          BPL     12$             ;IF NOT PROCEED.
034312                                  ERRDF   88,EMG30        ;TRANSMIT UNDERRUN.
034312  104455                                                                          TRAP    C$ERDF
034314  000130                                                                          .WORD   88
034316  014642                                                                          .WORD   EMG30
034320  000000                                                                          .WORD   0
034322  000510                          BR      50$
034324                          12$:

034324  032777  000004  145742          BIT     #TBE,@TXCSR     ;IS TRANSMIT BUFFER EMPTY?
034332  001057                          BNE     20$             ;IF YES - SEND A CHARACTER.
```

```
TEST 29 - DATA TEST
     51 034334  005305                          DEC     R5              ;DECREMENT LOOP COUNTER
     52 034336  001011                          BNE     15$             ;IF NOT ZERO OK.
     53 034340  005304                          DEC     R4              ;IS OUTER LOOP 0?
     54 034342  001402                          BEQ     13$             ;IF YES - TIME OUT
     55 034344  005005                          CLR     R5              ;CLEAR INNER LOOP TIMER
     56 034346  000405                          BR      15$
     57 034350                          13$:
     58 034350                                  ERRDF   89,EMG1
        034350  104455                                                                  TRAP    C$ERDF
        034352  000131                                                                  .WORD   89
        034354  013336                                                                  .WORD   EMG1
        034356  000000                                                                  .WORD   0
     59 034360  000471                          BR      50$
     60
     61 034362                          15$:
     62 034362  032777  002200  145700          BIT     #RSTARY!RDATRY,@RXCSR ;IS STATUS OR DATA READY
     63 034370  001745                          BEQ     10$             ;IF NOT CHECK TBE
     64 034372  017737  145672  002346          MOV     @RXCSR,IRXCSR   ;SAVE RXCSR
     65 034400  017737  145666  002350          MOV     @RDSR,IRDSR     ;SAVE RDSR
     66 034406  032737  000200  002346          BIT     #RDATRY,IRXCSR  ;IS DATA READY?
     67 034414  001404                          BEQ     17$
     68 034416  113721  002350                  MOVB    IRDSR,(R1)+     ;SAVE THE DATA
     69 034422  005237  002500                  INC     RCOUNT          ;INCREMENT COUNT
     70 034426                          17$:
     71 034426  032737  002000  002346          BIT     #RSTARY,IRXCSR  ;IS STATUS READY?
     72 034434  001723                          BEQ     10$             ;IF NOT CHECK TBE
     73 034436  032737  106000  002350          BIT     #ERR!ROVER!RABORT,IRDSR ;ANY ERRORS?
     74 034444  001005                          BNE     18$             ;IF YES, REPORT.
     75 034446  032737  001000  002350          BIT     #REOM,IRDSR     ;END OF MESSAGE.
     76 034454  001031                          BNE     30$
     77 034456  000712                          BR      10$
     78 034460                          18$:
     79 034460                                  ERRDF   90,EMG31
        034460  104455                                                                  TRAP    C$ERDF
        034462  000132                                                                  .WORD   90
        034464  014660                                                                  .WORD   EMG31
        034466  000000                                                                  .WORD   0
     80 034470  000425                          BR      50$
     81
     82
     83 034472                          20$:
     84 034472  032777  000400  145576          BIT     #TSOM,@TDSR     ;IS START OF MESSAGE SENT.
     85 034500  001405                          BEQ     25$             ;IF NOT, CONTINUE.
     86 034502  005037  002476                  CLR     XMITD           ;CLEAR XMIT COUNTER
     87 034506  042777  000400  145562          BIC     #TSOM,@TDSR     ;CLEAR START OF MESSAGE.
     88 034514                          25$:
     89 034514  112277  145556                  MOVB    (R2)+,@TDSR     ;TRANSMIT A CHARACTER.
     90 034520  005237  002476                  INC     XMITD           ;COUNT CHARACTER ACTUALLY TRANSMITTED.
     91 034524  005303                          DEC     R3              ;DECREMENT COUNTER
     92 034526  001315                          BNE     15$             ;IF NOT DONE LOOP
     93 034530  052777  001000  145540          BIS     #TEOM,@TDSR     ;SEND END OF MESSAGE.
     94 034536  000711                          BR      15$
     95
     96 034540                          30$:
     97 034540                                  CALL    $CHECK          ;CHECK THAT THE DATA WAS CORRECT.
     98
     99
```

```
TEST 29 - DATA TEST
    100 034544                          50$:
    101
    102 034544                          ENDTST
        034544                                      L10130:
        034544  104401                                      TRAP    C$ETST
    103
    104
    105
    106
    107
    108
```

```
TEST 30 - BOP DATA TEST
                                .SBTTL          TEST 30 - BOP DATA TEST
                                ;*****************************************************************
                                ;*              TEST 30 - DPV-11
                                ;* BOP DATA TEST
                                ;* TRANSMIT AND RECEIVE A COMPLETE DATA MESSAGE.  CHECK THAT THE
                                ;* DATA IS CORRECTLY RECEIVED.
                                ;*      SELECTED OPTIONS: BOP MODE, CRC-CCITT PRESET TO ZERO,
                                ;*                        6 BIT CHARACTERS, USER SELECTED LOOPBACK.
                                ;*
                                ;*****************************************************************
034546                          BGNTST
034546                                                                          T30::
034546                                  CALL    $SPEED          ;CAN THE CPU SUPPORT THE LOOPBACK?
034552  103462                          BCS     50$             ;IF NOT, SKIP THE TEST.
034554                                  CALL    $RESET          ;RESET THE DPV
034560                                  ESCAPE  TST             ;IF ERROR, BR TO THE END.
034560  104410                                                                  TRAP    C$ESCAPE
034562  000136                                                                  .WORD   L10131-.
034564  012737  100000  002362          MOV     #BOP,MODE       ;FLAG THAT WE ARE IN BOP MODE.
034572  012737  000400  002344          MOV     #CCITT0,IPCSAR  ;SET CRC-CCITT PRESET TO ZERO
034600  012737  000001  002414          MOV     #1,START        ;SEND 1 FLAG
034606  012737  000002  002340          MOV     #2,HEADER       ;SEND 2 HEADER CHARACTERS
034614  012737  000006  002352          MOV     #6,LENGTH       ;CHARACTER LENGTH OF 6 BITS.
034622  012737  000400  002434          MOV     #TSOM,TSTART    ;START OF MESSAGE.
034630  012737  001000  002422          MOV     #TEOM,TEND      ;END OF MESSAGE
034636  012737  002502  002470          MOV     #$CCITT,XTYPE   ;USE CCITT DATA PATTERN
034644  012737  000100  002472          MOV     #64.,XCOUNT     ;# OF CHARACTERS TO TRANSMIT
                                                                ;
034652  013777  002344  145412          MOV     IPCSAR,@PCSAR   ;SET UP PARAMETERS AND ADDRESS
034660  112737  000306  002342          MOVB    #306,IPCR       ;SET UP CHARACTER LENGTH

034666                                  CALL    $BUFRS          ;SET UP TRANSMIT AND RECEIVE BUFFERS.
034672  005037  002356                  CLR     MAINT           ;CLEAR FLAG TO INDICATE NO MAINTENACE LOOPBACK
034676  005037  002334                  CLR     EXERR           ;FLAG THAT NO ERRORS ARE EXPECTED IN $DATA
034702                                  CALL    $DATA           ;
034706  103402                          BCS     20$             ;IF ERROR SKIP DATA CHECK.

034710                                  CALL    $CHECK          ;CHECK THAT THE DATA WAS CORRECT.
034714                          20$:
034714                                  CALL    $MODEM          ;PRINT OUT MODEM CONTROL STATUS.
034720                          50$:

034720                          ENDTST
034720                                                                  L10131:
034720  104401                                                                  TRAP    C$ETST
```

TEST 31 - BOP DATA TEST

```
                                .SBTTL          TEST 31 - BOP DATA TEST
                                ;*****************************************************************
                                ;*              TEST 31 - DPV-11
                                ;* BOP DATA TEST
                                ;* TRANSMIT AND RECEIVE A COMPLETE DATA MESSAGE.  CHECK THAT THE
                                ;* DATA IS CORRECTLY RECEIVED.
                                ;*      SELECTED OPTIONS: BOP MODE, CRC-CCITT PRESET TO ONES,
                                ;*                        6 BIT CHARACTERS, USER SELECTED LOOPBACK.
                                ;*
                                ;*****************************************************************
034722                          BGNTST
034722                                                                          T31::
034722                                  CALL    $SPEED          ;CAN THE CPU SUPPORT THE LOOPBACK?
034726  103462                          BCS     50$             ;IF NOT, SKIP THE TEST.
034730                                  CALL    $RESET          ;RESET THE DPV
034734                                  ESCAPE  TST             ;IF ERROR, BR TO THE END.
034734  104410                                                                  TRAP    C$ESCAPE
034736  000136                                                                  .WORD   L10132-.
034740  012737  100000  002362          MOV     #BOP,MODE       ;FLAG THAT WE ARE IN BOP MODE.
034746  012737  000000  002344          MOV     #CCITT1,IPCSAR  ;SET CRC-CCITT PRESET TO ONE
034754  012737  000001  002414          MOV     #1,START        ;SEND 1 FLAG
034762  012737  000002  002340          MOV     #2,HEADER       ;SEND 2 HEADER CHARACTERS
034770  012737  000006  002352          MOV     #6,LENGTH       ;CHARACTER LENGTH OF 6 BITS.
034776  012737  000400  002434          MOV     #TSOM,TSTART    ;START OF MESSAGE.
035004  012737  001000  002422          MOV     #TEOM,TEND      ;END OF MESSAGE
035012  012737  002502  002470          MOV     #$CCITT,XTYPE   ;USE CCITT DATA PATTERN
035020  012737  000100  002472          MOV     #64.,XCOUNT     ;# OF CHARACTERS TO TRANSMIT
                                                                ;
035026  013777  002344  145236          MOV     IPCSAR,@PCSAR   ;SET UP PARAMETERS AND ADDRESS
035034  112737  000306  002342          MOVB    #306,IPCR       ;SET UP CHARACTER LENGTH

035042                                  CALL    $BUFRS          ;SET UP TRANSMIT AND RECEIVE BUFFERS.
035046  005037  002356                  CLR     MAINT           ;CLEAR FLAG TO INDICATE NO MAINTENACE LOOPBACK
035052  005037  002334                  CLR     EXERR           ;FLAG THAT NO ERRORS ARE EXPECTED IN $DATA
035056                                  CALL    $DATA           ;
035062  103402                          BCS     20$             ;IF ERROR SKIP DATA CHECK.

035064                                  CALL    $CHECK          ;CHECK THAT THE DATA WAS CORRECT.
035070                          20$:
035070                                  CALL    $MODEM          ;PRINT OUT MODEM CONTROL STATUS.
035074                          50$:

035074                          ENDTST
035074                                                                  L10132:
035074  104401                                                                  TRAP    C$ETST
```

```
TEST 32 - BOP DATA TEST
                                .SBTTL          TEST 32 - BOP DATA TEST
                                ;*****************************************************************************
                                ;*              TEST 32 - DPV-11
                                ;* BOP DATA TEST
                                ;* TRANSMIT AND RECEIVE A COMPLETE DATA MESSAGE.  CHECK THAT THE
                                ;* DATA IS CORRECTLY RECEIVED.
                                ;*      SELECTED OPTIONS: BOP MODE, CRC-CCITT PRESET TO ZERO,
                                ;*                        7 BIT CHARACTERS, USER SELECTED LOOPBACK.
                                ;*
                                ;*****************************************************************************
035076                          BGNTST
035076                                                                          T32::
035076                                  CALL    $SPEED          ;CAN THE CPU SUPPORT THE LOOPBACK?
035102  103470                          BCS     50$             ;IF NOT, SKIP THE TEST.
035104                                  CALL    $RESET          ;RESET THE DPV
035110                                  ESCAPE  TST             ;IF ERROR, BR TO THE END.
035110  104410                                                                  TRAP    C$ESCAPE
035112  000152                                                                  .WORD   L10133-.
035114  012737  100000  002362          MOV     #BOP,MODE       ;FLAG THAT WE ARE IN BOP MODE.
035122  012737  000400  002344          MOV     #CCITT0,IPCSAR  ;SET CRC-CCITT PRESET TO ZERO
035130  052737  010000  002344          BIS     #SECADR,IPCSAR  ;SET SECONDARY ADDRESS.
035136  112737  000123  002344          MOVB    #123,IPCSAR     ;SECONDARY ADDRESS.
035144  012737  000001  002414          MOV     #1,START        ;SEND 1 FLAG
035152  012737  000002  002340          MOV     #2,HEADER       ;SEND 2 HEADER CHARACTERS
035160  012737  000007  002352          MOV     #7,LENGTH       ;CHARACTER LENGTH OF 7 BITS.
035166  012737  000400  002434          MOV     #TSOM,TSTART    ;START OF MESSAGE.
035174  012737  001000  002422          MOV     #TEOM,TEND      ;END OF MESSAGE
035202  012737  002502  002470          MOV     #$CCITT,XTYPE   ;USE CCITT DATA PATTERN
035210  012737  000100  002472          MOV     #64.,XCOUNT     ;# OF CHARACTERS TO TRANSMIT
                                                                ;
035216  013777  002344  145046          MOV     IPCSAR,@PCSAR   ;SET UP PARAMETERS AND ADDRESS
035224  112737  000347  002342          MOVB    #347,IPCR       ;SET UP CHARACTER LENGTH

035232                                  CALL    $BUFRS          ;SET UP TRANSMIT AND RECEIVE BUFFERS.
035236  005037  002356                  CLR     MAINT           ;CLEAR FLAG TO INDICATE NO MAINTENACE LOOPBACK
035242  005037  002334                  CLR     EXERR           ;FLAG THAT NO ERRORS ARE EXPECTED IN $DATA
035246                                  CALL    $DATA           ;
035252  103402                          BCS     20$             ;IF ERROR SKIP DATA CHECK.

035254                                  CALL    $CHECK          ;CHECK THAT THE DATA WAS CORRECT.
035260                          20$:
035260                                  CALL    $MODEM          ;PRINT OUT MODEM CONTROL STATUS.
035264                          50$:

035264                          ENDTST
035264                                                                  L10133:
035264  104401                                                                  TRAP    C$ETST
```

TEST 33 - BOP DATA TEST

```
                                .SBTTL          TEST 33 - BOP DATA TEST
                                ;*****************************************************************
                                ;*              TEST 33 - DPV-11
                                ;* BOP DATA TEST
                                ;* TRANSMIT AND RECEIVE A COMPLETE DATA MESSAGE.  CHECK THAT THE
                                ;* DATA IS CORRECTLY RECEIVED.
                                ;*      SELECTED OPTIONS: BOP MODE, CRC-CCITT PRESET TO ONES,
                                ;*                        8 BIT CHARACTERS, USER SELECTED LOOPBACK.
                                ;*
                                ;*****************************************************************
035266                          BGNTST
035266                                                                          T33::
035266                                  CALL    $SPEED          ;CAN THE CPU SUPPORT THE LOOPBACK?
035272  103461                          BCS     50$             ;IF NOT, SKIP THE TEST.
035274                                  CALL    $RESET          ;RESET THE DPV
035300                                  ESCAPE  TST             ;IF ERROR, BR TO THE END.
035300  104410                                                                  TRAP    C$ESCAPE
035302  000134                                                                  .WORD   L10134-.
035304  012737  100000  002362          MOV     #BOP,MODE       ;FLAG THAT WE ARE IN BOP MODE.
035312  012737  000000  002344          MOV     #CCITT1,IPCSAR  ;SET CRC-CCITT PRESET TO ONE
035320  012737  000001  002414          MOV     #1,START        ;SEND 1 FLAG
035326  012737  000002  002340          MOV     #2,HEADER       ;SEND 2 HEADER CHARACTERS
035334  012737  000010  002352          MOV     #8.,LENGTH      ;CHARACTER LENGTH OF 8 BITS.
035342  012737  000400  002434          MOV     #TSOM,TSTART    ;START OF MESSAGE.
035350  012737  001000  002422          MOV     #TEOM,TEND      ;END OF MESSAGE
035356  012737  002502  002470          MOV     #$CCITT,XTYPE   ;USE CCITT DATA PATTERN
035364  012737  000100  002472          MOV     #64.,XCOUNT     ;# OF CHARACTERS TO TRANSMIT
                                                                ;
035372  013777  002344  144672          MOV     IPCSAR,@PCSAR   ;SET UP PARAMETERS AND ADDRESS
035400  105037  002342                  CLRB    IPCR            ;SET UP CHARACTER LENGTH

035404                                  CALL    $BUFRS          ;SET UP TRANSMIT AND RECEIVE BUFFERS.
035410  005037  002356                  CLR     MAINT           ;CLEAR FLAG TO INDICATE NO MAINTENACE LOOPBACK
035414  005037  002334                  CLR     EXERR           ;FLAG THAT NO ERRORS ARE EXPECTED IN $DATA
035420                                  CALL    $DATA           ;
035424  103402                          BCS     20$             ;IF ERROR SKIP DATA CHECK.

035426                                  CALL    $CHECK          ;CHECK THAT THE DATA WAS CORRECT.
035432                          20$:
035432                                  CALL    $MODEM          ;PRINT OUT MODEM CONTROL STATUS.
035436                          50$:

035436                          ENDTST
035436                                                                  L10134:
035436  104401                                                                  TRAP    C$ETST
```

```
TEST 34 - BOP DATA TEST
                                .SBTTL          TEST 34 - BOP DATA TEST

                                ;*****************************************************************
                                ;*              TEST 34 - DPV-11
                                ;* BOP DATA TEST
                                ;* TRANSMIT AND RECEIVE A COMPLETE DATA MESSAGE.  CHECK THAT THE
                                ;* DATA IS CORRECTLY RECEIVED.
                                ;* NOTE: CERTAIN USYNRTS ONLY TRANSMIT A SPECIAL START SEQUENCE WHEN
                                ;*       TRANSMIT START AND END OF MESSAGE ARE SET BY A BYTE OPERATION.
                                ;*      SELECTED OPTIONS: BOP MODE, CRC-CCITT PRESET TO ONES,
                                ;*                        6 BIT CHARACTERS, USER SELECTED LOOPBACK.
                                ;*
                                ;*****************************************************************
 035440                         BGNTST
 035440                                                                          T34::
 035440                                 CALL    $SPEED          ;CAN THE CPU SUPPORT THE LOOPBACK?
 035444  103462                         BCS     50$             ;IF NOT, SKIP THE TEST.
 035446                                 CALL    $RESET          ;RESET THE DPV
 035452                                 ESCAPE  TST             ;IF ERROR, BR TO THE END.
 035452  104410                                                                  TRAP    C$ESCAPE
 035454  000136                                                                  .WORD   L10135-.
 035456  012737  100000  002362         MOV     #BOP,MODE       ;FLAG THAT WE ARE IN BOP MODE.
 035464  012737  000000  002344         MOV     #CCITT1,IPCSAR  ;SET CRC-CCITT PRESET TO ONE
 035472  012737  000002  002414         MOV     #2,START        ;SEND 1 FLAG
 035500  012737  000002  002340         MOV     #2,HEADER       ;SEND 2 HEADER CHARACTERS
 035506  012737  000006  002352         MOV     #6,LENGTH       ;CHARACTER LENGTH OF 6 BITS.
 035514  012737  000003  002434         MOV     #3,TSTART       ;SET TSOM AND TEOM IN BYTE MODE.
 035522  012737  001000  002422         MOV     #TEOM,TEND      ;END OF MESSAGE
 035530  012737  002502  002470         MOV     #$CCITT,XTYPE   ;USE CCITT DATA PATTERN
 035536  012737  000100  002472         MOV     #64.,XCOUNT     ;# OF CHARACTERS TO TRANSMIT
                                                                ;
 035544  013777  002344  144520         MOV     IPCSAR,@PCSAR   ;SET UP PARAMETERS AND ADDRESS
 035552  112737  000306  002342         MOVB    #306,IPCR       ;SET UP CHARACTER LENGTH


 035560                                 CALL    $BUFRS          ;SET UP TRANSMIT AND RECEIVE BUFFERS.
 035564  005037  002356                 CLR     MAINT           ;CLEAR FLAG TO INDICATE NO MAINTENACE LOOPBACK
 035570  005037  002334                 CLR     EXERR           ;FLAG THAT NO ERRORS ARE EXPECTED IN $DATA
 035574                                 CALL    $DATA           ;
 035600  103402                         BCS     20$             ;IF ERROR SKIP DATA CHECK.

 035602                                 CALL    $CHECK          ;CHECK THAT THE DATA WAS CORRECT.
 035606                         20$:
 035606                                 CALL    $MODEM          ;PRINT OUT MODEM CONTROL STATUS.
 035612                         50$:
 035612                         ENDTST
 035612                                                                  L10135:
 035612  104401                                                                  TRAP    C$ETST

```

TEST 35 - BOP DATA TEST

```
                                .SBTTL          TEST 35 - BOP DATA TEST
                                ;*****************************************************************************
                                ;*              TEST 35 - DPV-11
                                ;* BOP DATA TEST
                                ;* TRANSMIT AND RECEIVE A COMPLETE DATA MESSAGE.  CHECK THAT THE
                                ;* DATA IS CORRECTLY RECEIVED.
                                ;*      SELECTED OPTIONS: BOP MODE, CRC-CCITT PRESET TO ZEROS,
                                ;*                        7 BIT CHARACTERS, USER SELECTED LOOPBACK.
                                ;*
                                ;*****************************************************************************
035614                          BGNTST
035614                                                                          T35::
035614                                  CALL    $SPEED          ;CAN THE CPU SUPPORT THE LOOPBACK?
035620  103465                          BCS     50$             ;IF NOT, SKIP THE TEST.
035622                                  CALL    $RESET          ;RESET THE DPV
035626                                  ESCAPE  TST             ;IF ERROR, BR TO THE END.
035626  104410                                                                  TRAP    C$ESCAPE
035630  000144                                                                  .WORD   L10136-.
035632  012737  100000  002362          MOV     #BOP,MODE       ;FLAG THAT WE ARE IN BOP MODE.
035640  012737  000400  002344          MOV     #CCITTO,IPCSAR  ;SET CRC-CCITT PRESET TO ZERO
035646  012737  100000  002344          MOV     #APA,IPCSAR     ;ALL PARTIES ADDRESS.
035654  012737  000001  002414          MOV     #1,START        ;SEND 1 FLAG
035662  012737  000002  002340          MOV     #2,HEADER       ;SEND 2 HEADER CHARACTERS
035670  012737  000007  002352          MOV     #7,LENGTH       ;CHARACTER LENGTH OF 7 BITS.
035676  012737  000400  002434          MOV     #TSOM,TSTART    ;START OF MESSAGE
035704  012737  001000  002422          MOV     #TEOM,TEND      ;END OF MESSAGE
035712  012737  002502  002470          MOV     #$CCITT,XTYPE   ;USE CCITT DATA PATTERN
035720  012737  000100  002472          MOV     #64.,XCOUNT     ;# OF CHARACTERS TO TRANSMIT
                                                                ;
035726  013777  002344  144336          MOV     IPCSAR,@PCSAR   ;SET UP PARAMETERS AND ADDRESS
035734  112737  000347  002342          MOVB    #347,IPCR       ;SET UP CHARACTER LENGTH

035742                                  CALL    $BUFRS          ;SET UP TRANSMIT AND RECEIVE BUFFERS.
035746  005037  002356                  CLR     MAINT           ;CLEAR FLAG TO INDICATE NO MAINTENACE LOOPBACK
035752  005037  002334                  CLR     EXERR           ;FLAG THAT NO ERRORS ARE EXPECTED IN $DATA
035756                                  CALL    $DATA           ;
035762  103402                          BCS     20$             ;IF ERROR SKIP DATA CHECK.

035764                                  CALL    $CHECK          ;CHECK THAT THE DATA WAS CORRECT.
035770                          20$:
035770                                  CALL    $MODEM          ;PRINT OUT MODEM CONTROL STATUS.
035774                          50$:

035774                          ENDTST
035774                                                                  L10136:
035774  104401                                                                  TRAP    C$ETST
```

```
TEST 36 - BOP DATA TEST
                                .SBTTL          TEST 36 - BOP DATA TEST
                                ;*****************************************************************************
                                ;*                      TEST 36 - DPV-11
                                ;* BOP DATA TEST
                                ;* TRANSMIT AND RECEIVE A COMPLETE DATA MESSAGE.  CHECK THAT THE
                                ;* DATA IS CORRECTLY RECEIVED.
                                ;*      SELECTED OPTIONS: BOP MODE, CRC-CCITT PRESET TO ZERO, LOOP SET,
                                ;*                        8 BIT CHARACTERS, USER SELECTED LOOPBACK.
                                ;*
                                ;*****************************************************************************
 035776                         BGNTST
 035776                                                                          T36::
 035776                                 CALL    $SPEED          ;CAN THE CPU SUPPORT THE LOOPBACK?
 036002  103465                         BCS     50$             ;IF NOT, SKIP THE TEST.
 036004                                 CALL    $RESET          ;RESET THE DPV
 036010                                 ESCAPE  TST             ;IF ERROR, BR TO THE END.
 036010  104410                                                                  TRAP    C$ESCAPE
 036012  000144                                                                  .WORD   L10137-.
 036014  012737  100000  002362         MOV     #BOP,MODE       ;FLAG THAT WE ARE IN BOP MODE.
 036022  012737  000400  002344         MOV     #CCITT0,IPCSAR  ;SET CRC-CCITT PRESET TO ZERO
 036030  052737  020000  002344         BIS     #LOOP,IPCSAR    ;SET LOOP MODE TO RECOGNIZE THE GO AHEAD.
 036036  012737  000001  002414         MOV     #1,START        ;SEND 1 FLAG
 036044  012737  000002  002340         MOV     #2,HEADER       ;SEND 2 HEADER CHARACTERS
 036052  012737  000010  002352         MOV     #8.,LENGTH      ;CHARACTER LENGTH OF 8 BITS.
 036060  012737  000400  002434         MOV     #TSOM,TSTART    ;START OF MESSAGE
 036066  012737  005000  002422         MOV     #TGA!TEOM,TEND  ;TRANSMIT GO AHEAD AT END OF MESSAGE.
 036074  012737  002502  002470         MOV     #$CCITT,XTYPE   ;USE CCITT DATA PATTERN
 036102  012737  000100  002472         MOV     #64.,XCOUNT     ;# OF CHARACTERS TO TRANSMIT
                                                                ;
 036110  013777  002344  144154         MOV     IPCSAR,@PCSAR   ;SET UP PARAMETERS AND ADDRESS
 036116  105037  002342                 CLRB    IPCR            ;SET UP CHARACTER LENGTH

 036122                                 CALL    $BUFRS          ;SET UP TRANSMIT AND RECEIVE BUFFERS.
 036126  005037  002356                 CLR     MAINT           ;CLEAR FLAG TO INDICATE NO MAINTENACE LOOPBACK
 036132  012737  000001  002334         MOV     #1,EXERR        ;FLAG THAT AN ERROR IS EXPECTED IN $DATA
 036140                                 CALL    $DATA           ;
 036144  103402                         BCS     20$             ;IF ERROR SKIP DATA CHECK.

 036146                                 CALL    $CHECK          ;CHECK THAT THE DATA WAS CORRECT.
 036152                         20$:
 036152                                 CALL    $MODEM          ;PRINT OUT MODEM CONTROL STATUS.
 036156                         50$:

 036156                         ENDTST
 036156                                                                  L10137:
 036156  104401                                                                  TRAP    C$ETST
```

TEST 37 - BCP DATA TEST

```
                                .SBTTL          TEST 37 - BCP DATA TEST
                                ;*****************************************************************************
                                ;*              TEST 37 - DPV-11
                                ;* BCP DATA TEST
                                ;* TRANSMIT AND RECEIVE A COMPLETE DATA MESSAGE.  CHECK THAT THE
                                ;* DATA IS CORRECTLY RECEIVED.
                                ;*      SELECTED OPTIONS: BCP MODE, VRC-ODD PARITY, IDLE BIT SET
                                ;*                        5 BIT CHARACTERS, USER SELECTED LOOPBACK.
                                ;*
                                ;*****************************************************************************
036160                          BGNTST
036160                                                                          T37::
036160                                  CALL    $SPEED          ;CAN THE CPU SUPPORT THE LOOPBACK?
036164  103475                          BCS     50$             ;IF NOT, SKIP THE TEST.
036166                                  CALL    $RESET          ;RESET THE DPV
036172                                  ESCAPE  TST             ;IF ERROR, BR TO THE END.
036172  104410                                                                  TRAP    C$ESCAPE
036174  000164                                                                  .WORD   L10140-.
036176  005037  002362                  CLR     MODE            ;FLAG THAT WE ARE IN BCP MODE.
036202  012737  000024  002344          MOV     #24,IPCSAR      ;LOAD SYNCH IN PCSAR (FOR RECEIVER ONLY)
036210  052737  002000  002344          BIS     #VRCO,IPCSAR    ;SET ODD VRC
036216  052737  040000  002344          BIS     #PROTO,IPCSAR   ;SET BCP PROTOCOL
036224  052737  004000  002344          BIS     #IDLE,IPCSAR    ;TRANSMIT SYNCH FROM TDSR
036232  012737  000002  002414          MOV     #2,START        ;SEND 2 SYNCHS
036240  012737  000001  002340          MOV     #1,HEADER       ;SEND 1 HEADER CHARACTER
036246  012737  000005  002352          MOV     #5,LENGTH       ;CHARACTER LENGTH OF 5 BITS.
036254  012737  000424  002434          MOV     #TSOM!24,TSTART ;START OF MESSAGE AND SYNCH CHARACTER.
036262  012737  001000  002422          MOV     #TEOM,TEND      ;END OF MESSAGE
036270  012737  002502  002470          MOV     #$CCITT,XTYPE   ;USE CCITT DATA PATTERN
036276  012737  000100  002472          MOV     #64.,XCOUNT     ;# OF CHARACTERS TO TRANSMIT
                                                                ;
036304  112737  000245  002342          MOVB    #245,IPCR       ;SET UP CHARACTER LENGTH
036312  113777  002342  143764          MOVB    IPCR,@PCR       ;SET UP CHARACTER LENGTH
036320  013777  002344  143744          MOV     IPCSAR,@PCSAR   ;SET UP PARAMETERS AND ADDRESS

036326                                  CALL    $BUFRS          ;SET UP TRANSMIT AND RECEIVE BUFFERS.
036332  005037  002356                  CLR     MAINT           ;CLEAR FLAG TO INDICATE NO MAINTENACE LOOPBACK
036336  005037  002334                  CLR     EXPERR          ;FLAG THAT NO ERRORS ARE EXPECTED IN $DATA
036342                                  CALL    $DATA           ;
036346  103402                          BCS     20$             ;IF ERROR SKIP DATA CHECK.

036350                                  CALL    $CHECK          ;CHECK THAT THE DATA WAS CORRECT.
036354                          20$:
036354                                  CALL    $MODEM          ;PRINT OUT MODEM CONTROL STATUS.
036360                          50$:

036360                          ENDTST
036360                                                                  L10140:
036360  104401                                                                  TRAP    C$ETST
```

TEST 38 - BCP DATA TEST

```
                                .SBTTL          TEST 38 - BCP DATA TEST
                                ;*******************************************************************************
                                ;*              TEST 38 - DPV-11
                                ;* BCP DATA TEST
                                ;* TRANSMIT AND RECEIVE A COMPLETE DATA MESSAGE.  CHECK THAT THE
                                ;* DATA IS CORRECTLY RECEIVED.
                                ;*      SELECTED OPTIONS: BCP MODE, VRC-EVEN PARITY,
                                ;*                        6 BIT CHARACTERS, USER SELECTED LOOPBACK.
                                ;*
                                ;*******************************************************************************
036362                          BGNTST
036362                                                                          T38::
036362                                  CALL    $SPEED          ;CAN THE CPU SUPPORT THE LOOPBACK?
036366  103472                          BCS     50$             ;IF NOT, SKIP THE TEST.
036370                                  CALL    $RESET          ;RESET THE DPV
036374                                  ESCAPE  TST             ;IF ERROR, BR TO THE END.
036374  104410                                                                  TRAP    C$ESCAPE
036376  000156                                                                  .WORD   L10141-.
036400  005037  002362                  CLR     MODE            ;FLAG THAT WE ARE IN BCP MODE.
036404  012737  002400  002344          MOV     #VRCE,IPCSAR    ;SET EVEN VRC
036412  052737  040000  002344          BIS     #PROTO,IPCSAR   ;SET BCP PROTOCOL
036420  112737  000105  002344          MOVB    #105,IPCSAR     ;SYNCH.
036426  012737  000002  002414          MOV     #2,START        ;SEND 2 SYNCHS
036434  012737  000001  002340          MOV     #1,HEADER       ;SEND 1 HEADER CHARACTER
036442  012737  000006  002352          MOV     #6,LENGTH       ;CHARACTER LENGTH OF 6 BITS.
036450  012737  000400  002434          MOV     #TSOM,TSTART    ;START OF MESSAGE
036456  012737  001000  002422          MOV     #TEOM,TEND      ;END OF MESSAGE
036464  012737  002502  002470          MOV     #$CCITT,XTYPE   ;USE CCITT DATA PATTERN
036472  012737  000100  002472          MOV     #64.,XCOUNT     ;# OF CHARACTERS TO TRANSMIT
                                                                ;
036500  112737  000306  002342          MOVB    #306,IPCR       ;SET UP CHARACTER LENGTH
036506  113777  002342  143570          MOVB    IPCR,@PCR       ;SET UP CHARACTER LENGTH
036514  013777  002344  143550          MOV     IPCSAR,@PCSAR   ;SET UP PARAMETERS AND ADDRESS

036522                                  CALL    $BUFRS          ;SET UP TRANSMIT AND RECEIVE BUFFERS.
036526  005037  002356                  CLR     MAINT           ;CLEAR FLAG TO INDICATE NO MAINTENACE LOOPBACK
036532  005037  002334                  CLR     EXERR           ;FLAG THAT NO ERRORS ARE EXPECTED IN $DATA
036536                                  CALL    $DATA           ;
036542  103402                          BCS     20$             ;IF ERROR SKIP DATA CHECK.

036544                                  CALL    $CHECK          ;CHECK THAT THE DATA WAS CORRECT.
036550                          20$:
036550                                  CALL    $MODEM          ;PRINT OUT MODEM CONTROL STATUS.
036554                          50$:

036554                          ENDTST
036554                                                                  L10141:
036554  104401                                                                  TRAP    C$ETST
```

TEST 39 - BCP DATA TEST

```
                                .SBTTL          TEST 39 - BCP DATA TEST
                                ;*********************************************************************
                                ;*              TEST 39 - DPV-11
                                ;* BCP DATA TEST
                                ;* TRANSMIT AND RECEIVE A COMPLETE DATA MESSAGE.  CHECK THAT THE
                                ;* DATA IS CORRECTLY RECEIVED.
                                ;*      SELECTED OPTIONS: BCP MODE, CRC-16 PRESET TO ONES, STRIP SYNCHS,
                                ;*                        7 BIT CHARACTERS, USER SELECTED LOOPBACK.
                                ;*
                                ;*********************************************************************
036556                          BGNTST
036556                                                                          T39::
036556                                  CALL    $SPEED          ;CAN THE CPU SUPPORT THE LOOPBACK?
036562  103475                          BCS     50$             ;IF NOT, SKIP THE TEST.
036564                                  CALL    $RESET          ;RESET THE DPV
036570                                  ESCAPE  TST             ;IF ERROR, BR TO THE END.
036570  104410                                                                  TRAP    C$ESCAPE
036572  000164                                                                  .WORD   L10142-.
036574  005037  002362                  CLR     MODE            ;FLAG THAT WE ARE IN BCP MODE.
036600  012737  001400  002344          MOV     #CRC16,IPCSAR   ;SET CRC 16
036606  052737  040000  002344          BIS     #PROTO,IPCSAR   ;SET BCP PROTOCOL
036614  052737  020000  002344          BIS     #SSYNCH,IPCSAR  ;STRIP SYNCH.
036622  112737  000217  002344          MOVB    #217,IPCSAR     ;SYNCH
036630  012737  000005  002414          MOV     #5,START        ;SEND 5 SYNCHS
036636  012737  000001  002340          MOV     #1,HEADER       ;SEND 1 HEADER CHARACTER
036644  012737  000007  002352          MOV     #7,LENGTH       ;CHARACTER LENGTH OF 7 BITS.
036652  012737  000400  002434          MOV     #TSOM,TSTART    ;START OF MESSAGE
036660  012737  001000  002422          MOV     #TEOM,TEND      ;END OF MESSAGE
036666  012737  002502  002470          MOV     #$CCITT,XTYPE   ;USE CCITT DATA P**TERN
036674  012737  000100  002472          MOV     #64.,XCOUNT     ;# OF CHARACTERS T  TRANSMIT
                                                                ;
036702  112737  000347  002342          MOVB    #347,IPCR       ;CHARACTER LENGTH
036710  113777  002342  143366          MOVB    IPCR,@PCR       ;SET UP CHARACTER LENGTH
036716  013777  002344  143346          MOV     IPCSAR,@PCSAR   ;SET UP PARAMETERS AND ADDRESS


036724                                  CALL    $BUFRS          ;SET UP TRANSMIT AND RECEIVE BUFFERS.
036730  005037  002356                  CLR     MAINT           ;CLEAR FLAG TO INDICATE NO MAINTENACE LOOPBACK
036734  005037  002334                  CLR     EXERR           ;FLAG THAT NO ERRORS ARE EXPECTED IN $DATA
036740                                  CALL    $DATA           ;
036744  103402                          BCS     20$             ;IF ERROR SKIP DATA CHECK.

036746                                  CALL    $CHECK          ;CHECK THAT THE DATA WAS CORRECT.
036752                          20$:
036752                                  CALL    $MODEM          ;PRINT OUT MODEM CONTROL STATUS.
036756                          50$:

036756                          ENDTST
036756                                                                  L10142:
036756  104401                                                                  TRAP    $ETST
```

```
TEST 40 - BCP DATA TEST
                                .SBTTL          TEST 40 - BCP DATA TEST

                                ;*****************************************************************************
                                ;*              TEST 40 - DPV-11
                                ;* BCP DATA TEST
                                ;* TRANSMIT AND RECEIVE A COMPLETE DATA MESSAGE.  CHECK THAT THE
                                ;* DATA IS CORRECTLY RECEIVED.
                                ;*      SELECTED OPTIONS: BCP MODE, CRC-16 PRESET TO ONES,
                                ;*                        8 BIT CHARACTERS, USER SELECTED LOOPBACK.
                                ;*
                                ;*****************************************************************************
                                BGNTST
036760                                                                                  T40::
036760  
036760          CALL    $SPEED          ;CAN THE CPU SUPPORT THE LOOPBACK?
036764  103463  BCS     50$             ;IF NOT, SKIP THE TEST.
036766          CALL    $RESET          ;RESET THE DPV
036772          ESCAPE  TST             ;IF ERROR, BR TO THE END.
036772  104410                                                          TRAP    C$ESCAPE
036774  000140                                                          .WORD   L10143-.
036776  005037  002362          CLR     MODE            ;FLAG THAT WE ARE IN BCP MODE.
037002  012737  001400  002344  MOV     #CRC16,IPCSAR   ;SET CRC16
037010  052737  040000  002344  BIS     #PROTO,IPCSAR   ;SET BCP PROTOCOL
037016  012737  000002  002414  MOV     #2,START        ;SEND 2 SYNCHS
037024  012737  000001  002340  MOV     #1,HEADER       ;SEND 1 HEADER CHARACTER
037032  012737  000010  002352  MOV     #8.,LENGTH      ;CHARACTER LENGTH OF 8 BITS.
037040  012737  000400  002434  MOV     #TSOM,TSTART    ;START OF MESSAGE
037046  012737  001000  002422  MOV     #TEOM,TEND      ;END OF MESSAGE
037054  012737  002502  002470  MOV     #$CCITT,XTYPE   ;USE CCITT DATA PATTERN
037062  012737  000100  002472  MOV     #64.,XCOUNT     ;# OF CHARACTERS TO TRANSMIT
                                ;
037070  105037  002342          CLRB    IPCR            ;CHARACTER LENGTH
037074  013777  002344  143170  MOV     IPCSAR,@PCSAR   ;SET UP PARAMETERS AND ADDRESS

037102          CALL    $BUFRS          ;SET UP TRANSMIT AND RECEIVE BUFFERS.
037106  005037  002356          CLR     MAINT           ;CLEAR FLAG TO INDICATE NO MAINTENACE LOOPBACK
037112  005037  002334          CLR     EXERR           ;FLAG THAT NO ERRORS ARE EXPECTED IN $DATA
037116          CALL    $DATA           ;
037122  103402  BCS     20$             ;IF ERROR SKIP DATA CHECK.

037124          CALL    $CHECK          ;CHECK THAT THE DATA WAS CORRECT.
037130  20$:
037130          CALL    $MODEM          ;PRINT OUT MODEM CONTROL STATUS.
037134  50$:

037134  ENDTST
037134  
037134                                                          L10143:
037134  104401                                                          TRAP    C$ETST
```

```
                        .SBTTL          TEST 41 - DDCMP DATA TEST

                        ;*****************************************************************
                        ;*              TEST 41 - DPV-11
                        ;* DDCMP DATA TEST
                        ;* TRANSMIT AND RECEIVE A COMPLETE DATA MESSAGE USING THE
                        ;* DDCMP MESSAGE FORMAT.  CHECK THAT THE DATA IS CORRECTLY RECEIVED
                        ;* AND THAT THE CRC CHARACTERS ARE RECEIVED IN THE PROPER DDCMP
                        ;* ORDER.
                        ;*      SELECTED OPTIONS: BCP MODE, CRC-16 PRESET TO ONES, STRIP SYNCHS
                        ;*                        8 BIT CHARACTERS, USER SELECTED LOOPBACK.
                        ;*
                        ;*****************************************************************
 037136                 BGNTST
 037136                                                                  T41::
 037136                         CALL    $SPEED          ;CAN THE CPU SUPPORT THE LOOPBACK?
 037142  103521                BCS     50$             ;IF NOT, SKIP THE TEST.
 037144                         CALL    $RESET          ;RESET THE DPV
 037150                         ESCAPE  TST             ;IF ERROR, BR TO THE END.
 037150  104410                                                          TRAP    C$ESCAPE
 037152  000234                                                          .WORD   L10144-.
 037154  012737  000006  002414        MOV     #6,START        ;SEND 6 SYNCHS
 037162  005037  002340                CLR     HEADER          ;CLEAR DDCMP HEADER FLAG
                                                                ;
 037166  012777  061626  143076        MOV     #SSYNCH!PROTO!CRC16!SYN,@#CSAR  ;SET BCP PROTOCOL AND CRC16.
                                                                ;STRIP SYNCH AND SYNCH CHAR.
 037174  012701  003273                MOV     #RCVBUF,R1      ;RECEIVE BUFFER
 037200  012703  000014                MOV     #14,R3          ;BUFFER COUNT
 037204                         1$:
 037204  005021                        CLR     (R1)+           ;CLEAR THE BUFFER
 037206  005303                        DEC     R3              ;DECREMENT COUNT
 037210  001375                        BNE     1$              ;CONTINUE UNTIL DONE.

 037212  012701  003273        MOV     #RCVBUF,R1      ;RECEIVE BUFFER.
 037216  012702  002650        MOV     #DDCMP,R2       ;TRANSMIT BUFFER ADDRESS
 037222  012703  000006        MOV     #DDCMP1,R3      ;TRANSMIT COUNT
 037226  005037  002376        CLR     RFLAG           ;CLEAR RECEIVE FLAG.
 037232  005037  002360        CLR     MCFLAG          ;CLEAR MODEM CONTROL FLAG.

 037236                 SETVEC  XMTVEC,#XDDCMP,#PRI04   ;TRANSMIT VECTOR
 037236  012746  000200                                                  MOV     #PRI04,-(SP)
 037242  012746  017420                                                  MOV     #XDDCMP,-(SP)
 037246  013746  002266                                                  MOV     XMTVEC,-(SP)
 037252  012746  000003                                                  MOV     #3,-(SP)
 037256  104437                                                          TRAP    C$SVEC
 037260  062706  000010                                                  ADD     #10,SP
 037264                 SETVEC  RCVEC,#RDATA,#PRI04     ;RECEIVE VECTOR.
 037264  012746  000200                                                  MOV     #PRI04,-(SP)
 037270  012746  016544                                                  MOV     #RDATA,-(SP)
 037274  013746  002264                                                  MOV     RCVEC,-(SP)
 037300  012746  000003                                                  MOV     #3,-(SP)
 037304  104437                                                          TRAP    C$SVEC
 037306  062706  000010                                                  ADD     #10,SP
 037312                 SETPRI  #PRI00          ;ENABLE INTERRUPTS
 037312  012700  000000                                                  MOV     #PRI00,R0
 037316  104441                                                          TRAP    C$SPRI
```

```
TEST 41 - DDCMP DATA TEST
     41
     42 037320  005037  002334                CLR     EXERR           ;NO ERROR EXPECTED.
     43 037324  012737  000027  002474        MOV     #DDCMP1+DDCMP2+4,ECOUNT ;DETERMINE END COUNT
     44 037332                                CALL    $DATA1          ;
     45 037336                                ESCAPE  TST             ;IF ERROR, BR TO END
        037336  104410                                                          TRAP    C$ESCAPE
        037340  000046                                                          .WORD   L10144-.
     46
     47 037342  012701  003273                MOV     #RCVBUF,R1      ;RECEIVE BUFFER.
     48 037346  012702  002650                MOV     #DDCMP,R2       ;TRANSMIT BUFFER ADDRESS
     49 037352  012703  000006                MOV     #DDCMP1,R3      ;TRANSMIT COUNT
     50
     51 037356                                CALL    $CHK1           ;CHECK THE DATA RECEIVED
     52 037362                                ESCAPE  TST             ;IF ERROR, BR TO END
        037362  104410                                                          TRAP    C$ESCAPE
        037364  000022                                                          .WORD   L10144-.
     53 037366  062701  000002                ADD     #2,R1           ;INCREMENT THE RECEIVE BUFFER BY 2
     54                                                               ;IN ORDER TO COMPENSATE FOR CRC
     55 037372  012703  000015                MOV     #DDCMP2,R3      ;MESSAGE COUNT
     56 037376                                CALL    $CHK1           ;CHECK THE DATA RECEIVED
     57 037402                                ESCAPE  TST             ;IF ERROR, BR TO END
        037402  104410                                                          TRAP    C$ESCAPE
        037404  000002                                                          .WORD   L10144-.
     58 037406                          50$:
     59
     60
     61 037406                          ENDTST
        037406                                                          L10144:
        037406  104401                                                          TRAP    C$ETST
     62
     63
```

TEST 42 - HIGH SPEED BCP DATA TEST

```
                                .SBTTL          TEST 42 - HIGH SPEED BCP DATA TEST

                                ;*****************************************************************
                                ;*              TEST 42 - DPV-11
                                ;* BCP DATA TEST
                                ;* TRANSMIT AND RECEIVE A COMPLETE DATA MESSAGE.  CHECK THAT THE
                                ;* DATA IS CORRECTLY RECEIVED.
                                ;*      SELECTED OPTIONS: BCP MODE, CRC-16 PRESET TO ONES,
                                ;*                        8 BIT CHARACTERS, USER SELECTED LOOPBACK.
                                ;*
                                ;*****************************************************************
037410                          BGNTST
                                                                                        T42::
037410                                  CALL    $RESET          ;RESET THE DPV
037414                                  ESCAPE  TST             ;IF ERROR, BR TO THE END.
037414  104410                                                                          TRAP    C$ESCAPE
037416  000264                                                                          .WORD   L10145-.

                                        ;SET CRC16 AND BCP PROTOCOL.
037420  012777  041400  142644          MOV     #CRC16.PROTO,@PCSAR
037426  012737  000002  002414          MOV     #2,START        ;SEND 2 SYNCHS
037434  012737  000100  002472          MOV     #64.,XCOUNT     ;# OF CHARACTERS TO TRANSMIT
037442  012737  000100  002326          MOV     #64.,COUNTER    ;# OF CHARACTERS RECEIVED
037450  005037  002362                  CLR     MODE            ;FLAG THAT THIS A BCP MODE TEST
037454  005037  002376                  CLR     RFLAG           ;CLEAR RECEIVER FLAG
037460  005037  002500                  CLR     RCOUNT          ;CLEAR RECEIVER COUNT
037464  005037  002476                  CLR     XMITD           ;CLEAR TRANSMITTER COUNT
037470  005037  002334                  CLR     EXERR           ;FLAG THAT NO ERRORS ARE EXPECTED IN $DATA
037474  012701  003273                  MOV     #RCVBUF,R1      ;RECEIVE BUFFER
037500  012703  000040                  MOV     #32.,R3         ;BUFFER COUNT
037504                          1$:
037504  005021                  CLR     (R1)+           ;CLEAR THE BUFFER
037506  005303                  DEC     R3              ;DECREMENT COUNT
037510  001375                  BNE     1$              ;CONTINUE UNTIL DONE.

037512  012701  003273          MOV     #RCVBUF,R1      ;RECEIVE BUFFER
037516  012702  002502          MOV     #$CCITT,R2      ;XMIT PATTERN
037522  012703  000100          MOV     #64.,R3         ;XMIT COUNT

037526                          SETVEC  XMTVEC,#XDATA2,#PRI04   ;TRANSMIT VECTOR
037526  012746  000200                                                          MOV     #PRI04,-(SP)
037532  012746  017330                                                          MOV     #XDATA2,-(SP)
037536  013746  002266                                                          MOV     XMTVEC,-(SP)
037542  012746  000003                                                          MOV     #3,-(SP)
037546  104437                                                                  TRAP    C$SVEC
037550  062706  000010                                                          ADD     #10,SP

037554                          SETVEC  RCVEC,#RDATA2,#PRI04    ;RECEIVE VECTOR.
037554  012746  000200                                                          MOV     #PRI04,-(SP)
037560  012746  016776                                                          MOV     #RDATA2,-(SP)
037564  013746  002264                                                          MOV     RCVEC,-(SP)
037570  012746  000003                                                          MOV     #3,-(SP)
037574  104437                                                                  TRAP    C$SVEC
037576  062706  000010                                                          ADD     #10,SP

037602                          SETPRI  #PRI00          ;ENABLE INTERRUPTS
037602  012700  000000                                                          MOV     #PRI00,R0
037606  104441                                                                  TRAP    C$SPRI

037610  042737  000040  002404  BIC     #DSITEN,RXINIT  ;CLEAR DATA SET INTERRUPT.
```

```
TEST 42 - HIGH SPEED BCP DATA TEST
     41 037616                                  CALL    $DATA1          ;DO THE DATA TRANSFER.
     42 037622  052737  000040  002404          BIS     #DSITEN,RXINIT  ;RESET DATA SET INTERRUPT IN MASK.
     43 037630  103014                          BCC     10$             ;IF NO ERROR, PROCEED.
     44 037632  005737  002312                  TST     CPU             ;WAS THIS A LSI 11/23?
     45 037636  001021                          BNE     20$             ;IF YES - SKIP THE PROMPT.
     46 037640                                  PRINTX  #FMG28          ;PROMPT USER: IF THIS IS A LSI11 (M7264)
        037640  012746  012754                                                          MOV     #FMG28,-(SP)
        037644  012746  000001                                                          MOV     #1,-(SP)
        037650  010600                                                                  MOV     SP,R0
        037652  104415                                                                  TRAP    C$PNTX
        037654  062706  000004                                                          ADD     #4,SP
     47                                                             ;WITH MEMORY REFRESH, CAN'T RUN.
     48 037660  000410                          BR      20$
     49 037662                          10$:
     50 037662  012701  003273                  MOV     #RCVBUF,R1      ;RECEIVE BUFFER
     51 037666  012702  002502                  MOV     #$CCITT,R2      ;XMIT PATTERN
     52 037672  012703  000100                  MOV     #64.,R3         ;XMIT COUNT
     53
     54 037676                                  CALL    $CHK1           ;CHECK THAT THE DATA WAS CORRECT.
     55 037702                          20$:
     56
     57 037702                          ENDTST
        037702                                                                  L10145:
        037702  104401                                                                  TRAP    C$ETST
     58
     59
     60
```

TEST 43 - HIGH SPEED BOP DATA TEST

```
                                .SBTTL          TEST 43 - HIGH SPEED BOP DATA TEST

                                ;*************************** ************************************************
                                ;*              TEST 43 - DPV-11
                                ;* BOP DATA TEST
                                ;* TRANSMIT AND RECEIVE A COMPLETE DATA MESSAGE.  CHECK THAT THE
                                ;* DATA IS CORRECTLY RECEIVED.
                                ;*      SELECTED OPTIONS: BOP MODE, CRC-CCITT PRESET TO ONES,
                                ;*                        8 BIT CHARACTERS, USER SELECTED LOOPBACK.
                                ;*
                                ;*****************************************************************************
                                BGNTST
                                                                                        T43::
                                        CALL    $RESET          ;RESET THE DPV
                                        ESCAPE  TST             ;IF ERROR, BR TO THE END.
037710  104410                                                                          TRAP    C$ESCAPE
037712  000266                                                                          .WORD   L10146-.
037714  012777  000000  142350          MOV     #CCITT1,@PCSAR  ;SET CRC-CCITT
037722  012737  000002  002414          MOV     #2,START        ;SEND 2 SYNCHS
037730  012737  000100  002472          MOV     #64.,XCOUNT     ;# OF CHARACTERS TO TRANSMIT
037736  012737  000100  002326          MOV     #64.,COUNTER    ;# OF CHARACTERS RECEIVED
037744  012737  100000  002362          MOV     #BOP,MODE       ;FLAG THAT THIS A BOP MODE TEST.
037752  005037  002376                  CLR     RFLAG           ;CLEAR RECEIVER FLAG
037756  005037  002500                  CLR     RCOUNT          ;CLEAR RECEIVER COUNT
037762  005037  002476                  CLR     XMITD           ;CLEAR TRANSMITTER COUNT
037766  005037  002334                  CLR     EXERR           ;FLAG THAT NO ERRORS ARE EXPECTED IN $DATA
037772  012701  003273                  MOV     #RCVBUF,R1      ;RECEIVE BUFFER
037776  012703  000040                  MOV     #32.,R3         ;BUFFER COUNT
040002                          1$:
040002  005021                  CLR     (R1)+           ;CLEAR THE BUFFER
040004  005303                  DEC     R3              ;DECREMENT COUNT
040006  001375                  BNE     1$              ;CONTINUE UNTIL DONE.

040010  012701  003273          MOV     #RCVBUF,R1      ;RECEIVE BUFFER
040014  012702  002502          MOV     #$CCITT,R2      ;XMIT PATTERN
040020  012703  000100          MOV     #64.,R3         ;XMIT COUNT

040024                          SETVEC  XMTVEC,#XDATA2,#PRI04   ;TRANSMIT VECTOR
040024  012746  000200                                                          MOV     #PRI04,-(SP)
040030  012746  017330                                                          MOV     #XDATA2,-(SP)
040034  013746  002266                                                          MOV     XMTVEC,-(SP)
040040  012746  000003                                                          MOV     #3,-(SP)
040044  104437                                                                  TRAP    C$SVEC
040046  062706  000010                                                          ADD     #10,SP
040052                          SETVEC  RCVEC,#RDATA2,#PRI04    ;RECEIVE VECTOR.
040052  012746  000200                                                          MOV     #PRI04,-(SP)
040056  012746  016776                                                          MOV     #RDATA2,-(SP)
040062  013746  002264                                                          MOV     RCVEC,-(SP)
040066  012746  000003                                                          MOV     #3,-(SP)
040072  104437                                                                  TRAP    C$SVEC
040074  062706  000010                                                          ADD     #10,SP
040100                          SETPRI  #PRI00          ;ENABLE INTERRUPTS
040100  012700  000000                                                          MOV     #PRI00,R0
040104  104441                                                                  TRAP    C$SPRI

040106  042737  000040  002404  BIC     #DSITEN,RXINIT  ;CLEAR DATA SET INTERRUPT.
040114                          CALL    $DATA1          ;DO THE DATA TRANSFER.
```

```
TEST 43 - HIGH SPEED BOP DATA TEST
     41 040120  052737  000040  002404          BIS     #DSITEN,RXINIT  ;RESET DATA SET INTERRUPT IN MASK.
     42 040126  103014                          BCC     10$             ;IF NO ERROR, PROCEED.
     43 040130  005737  002312                  TST     CPU             ;WAS THIS A LSI 11/23?
     44 040134  001021                          BNE     20$             ;IF YES - SKIP THE PROMPT.
     45 040136                                  PRINTX  #FMG28          ;PROMPT USER: IF THIS IS A LSI11 (M7264)
        040136  012746  012754                                                  MOV     #FMG28,-(SP)
        040142  012746  000001                                                  MOV     #1,-(SP)
        040146  010600                                                          MOV     SP,R0
        040150  104415                                                          TRAP    C$PNTX
        040152  062706  000004                                                  ADD     #4,SP
     46                                                             ;WITH MEMORY REFRESH, CAN'T RUN.
     47 040156  000410                          BR      20$
     48 040160                          10$:
     49
     50 040160  012701  003273                  MOV     #RCVBUF,R1      ;RECEIVE BUFFER
     51 040164  012702  002502                  MOV     #$CCITT,R2      ;XMIT PATTERN
     52 040170  012703  000100                  MOV     #64.,R3         ;XMIT COUNT
     53
     54 040174                                  CALL    $CHK1           ;CHECK THAT THE DATA WAS CORRECT.
     55 040200                          20$:
     56
     57 040200                          ENDTST
        040200                                                                  L10146:
        040200  104401                                                                 TRAP    C$ETST
     58
     59
     60
     61
     62
```

```
HARDWARE PARAMETER CODING SECTION
                                .SBTTL  HARDWARE PARAMETER CODING SECTION


                                ;*****************************************************************
                                ;  THE HARDWARE PARAMETER CODING SECTION CONTAINS MACROS
                                ;  THAT ARE USED BY THER 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.
                                ;*****************************************************************

 040202                                 BGNHRD
 040202  000020                                                           .WORD L10147-L$HARD/2
 040204                                                                L$HARD::
                                GPRMA   P1,0,0,160000,177776,YES
 040204  000031                                                         .WORD   T$CODE
 040206  040244                                                         .WORD   P1
 040210  160000                                                         .WORD   T$LOLIM
 040212  177776                                                         .WORD   T$HILIM
                                GPRMA   P2,2,0,0,776,YES
 040214  001031                                                         .WORD   T$CODE
 040216  040256                                                         .WORD   P2
 040220  000000                                                         .WORD   T$LOLIM
 040222  000776                                                         .WORD   T$HILIM
                                GPRMD   P3,4,0,7,0,4,YES
 040224  002032                                                         .WORD   T$CODE
 040226  040267                                                         .WORD   P3
 040230  000007                                                         .WORD   7
 040232  000000                                                         .WORD   T$LOLIM
 040234  000004                                                         .WORD   T$HILIM
                                GPRML   P4,6,-1,YES
 040236  003130                                                         .WORD   T$CODE
 040240  040427                                                         .WORD   P4
 040242  177777                                                         .WORD   -1

 040244                                 ENDHRD
 040244                                                                 .EVEN
                                                                     L10147:

 040244  101  104  104  P1:    .ASCIZ  /ADDRESS: /
 040247  122  105  123
 040252  123  072  040
 040255  000
 040256  126  105  103  P2:    .ASCIZ  /VECTOR: /
 040261  124  117  122
 040264  072  040  000
 040267  114  117  117  P3:    .ASCII  /LOOPBACK -/<CR><LF>
 040272  120  102  101
 040275  103  113  040
 040300  055  015  012
 040303  040  040  060         .ASCII  /  0 = INTERNAL, 1 = RS423, 2 - RS422/<CR><LF>
 040306  040  075  040
 040311  111  116  124
 040314  105  122  116
 040317  101  114  054
```

```
HARDWARE PARAMETER CODING SECTION
        040322      040     061     040
        040325      075     040     122
        040330      123     064     062
        040333      063     054     040
        040336      062     040     075
        040341      040     122     123
        040344      064     062     062
        040347      015     012
    26  040351      040     040     063             .ASCIZ  /  3 = LOCAL MODEM LOOP, 4 = REMOTE MODEM LOOP/
        040354      040     075     040
        040357      114     117     103
        040362      101     114     040
        040365      115     117     104
        040370      105     115     040
        040373      114     117     117
        040376      120     054     040
        040401      064     040     075
        040404      040     122     105
        040407      115     117     124
        040412      105     040     115
        040415      117     104     105
        040420      115     040     114
        040423      117     117     120
        040426      000
    27  040427      111     123     040     P4:     .ASCIZ  /IS THE PROCESSOR A LSI-11/<57>/23 (M8186)/
        040432      124     110     105
        040435      040     120     122
        040440      117     103     105
        040443      123     123     117
        040446      122     040     101
        040451      040     114     123
        040454      111     055     061
        040457      061     057     062
        040462      063     040     050
        040465      115     070     061
        040470      070     066     051
        040473      000
    28                                          .EVEN
    29
    30                                  ;****************************** PATCH AREA ***********************************
    31  040474                          PATCH:
    32          040534                          .=.+40
    33  040534  000240                          NOP
    34  040536  000240                          NOP
    35  040540  000240                          NOP
    36                                  ;*****************************************************************************
    37
    38
    39  040542                          ENDMOD
    40
    41  040542                                  LASTAD
                                                                                        .EVEN
        040542  000000                                                                 .WORD   0
        040544  000000                                                                 .WORD   0
        040546                          L$LAST::
    42          000001                  .END
```

SYMBOL TABLE

```
ABC     031661          C$BRK = 000022          DIAGMC= 000000          ERRG14  010640 G        FMODE5  006155
ABURT   002322          C$BSEG= 000004          DM    = 001000          ERRG15  010724 G        FMODE6  006205
ACOUNT= 000045          C$BSUB= 000002          DSCNG = 100000          ERRG2   006560 G        FMS1    004102
ADR   = 000020 G        C$CEFG= 000045          DSITEN= 000040          ERRG3   006674 G        FMT0    020076
ALL   = 000000          C$CLCK= 000062          DTR   = 000002          ERRG4   006752 G        FMT1    020150
ALPHA   002602          C$CLEA= 000012          ECOUNT  002474          ERRG7   007052 G        FOUR  = 040000
APA   = 100000          C$CLOS= 000035          EF.CON= 000036 G        ERRG8   007152 G        FRSPAS  002316
ASSEMB= 000010          C$CLP1= 000006          EF.NEW= 000035 G        ERRG9   007252 G        FRSTIM  002314
BITS    002324          C$CVEC= 000036          EF.PWR= 000034 G        ERROR   002332          F$AU  = 000015
BIT0  = 000001 G        C$DCLN= 000044          EF.RES= 000037 G        EVL   = 000004 G        F$AUTO= 000020
BIT00 = 000001 G        C$DODU= 000051          EF.STA= 000040 G        EXADD = 000020          F$BGN = 000040
BIT01 = 000002 G        C$DRPT= 000024          EMG0    013246          EXCON = 000010          F$CLEA= 000007
BIT02 = 000004 G        C$DU  = 000053          EMG1    013336          EXERR   002334          F$DU  = 000016
BIT03 = 000010 G        C$EDIT= 000003          EMG10   013633          E$END = 002100          F$END = 000041
BIT04 = 000020 G        C$ERDF= 000055          EMG11   013705          E$LOAD= 000035          F$HARD= 000004
BIT05 = 000040 G        C$ERHR= 000056          EMG12   013736          FINIT1  016124          F$HW  = 000013
BIT06 = 000100 G        C$ERRO= 000060          EMG13   013762          FINIT2  016217          F$INIT= 000006
BIT07 = 000200 G        C$ERSF= 000054          EMG14   014043          FIVE  = 050000          F$JMP = 000050
BIT08 = 000400 G        C$ERSO= 000057          EMG15   014117          FLAG    002336          F$MOD = 000000
BIT09 = 001000 G        C$ESCA= 000010          EMG16   014152          FMDROP  017574          F$MSG = 000011
BIT1  = 000002 G        C$ESEG= 000005          EMG17   014221          FMG0    010750          F$PROT= 000021
BIT10 = 002000 G        C$ESUB= 000003          EMG18   014261          FMG1    011046          F$PWR = 000017
BIT11 = 004000 G        C$ETST= 000001          EMG19   014310          FMG10   011454          F$RPT = 000012
BIT12 = 010000 G        C$EXIT= 000032          EMG2    013347          FMG11   011520          F$SEG = 000003
BIT13 = 020000 G        C$GETB= 000026          EMG20   014341          FMG12   011564          F$SOFT= 000005
BIT14 = 040000 G        C$GETW= 000027          EMG21   014370          FMG13   011630          F$SRV = 000010
BIT15 = 100000 G        C$GMAN= 000043          EMG22   014432          FMG14   011674          F$SUB = 000002
BIT2  = 000004 G        C$GPHR= 000042          EMG23   014457          FMG15   011751          F$SW  = 000014
BIT3  = 000010 G        C$GPLO= 000030          EMG24   014535          FMG16   012013          F$TEST= 000001
BIT4  = 000020 G        C$GPRI= 000040          EMG25   014601          FMG17   012024          GETPRM  015440
BIT5  = 000040 G        C$INIT= 000011          EMG26   014627          FMG18   012101          G$CNTO= 000200
BIT6  = 000100 G        C$INLP= 000020          EMG3    013414          FMG19   012150          G$DELM= 000372
BIT7  = 000200 G        C$MANI= 000050          EMG30   014642          FMG2    011103          G$DISP= 000003
BIT8  = 000400 G        C$MEM = 000031          EMG31   014660          FMG20   012215          G$EXCP= 000400
BIT9  = 001000 G        C$MSG = 000023          EMG32   014677          FMG21   012302          G$HILI= 000002
BOE   = 000400 G        C$OPEN= 000034          EMG33   014722          FMG22   012351          G$LOLI= 000001
BOP   = 100000          C$PNTB= 000014          EMG34   014750          FMG23   012416          G$NO  = 000000
CCITT0= 000400          C$PNTF= 000017          EMG35   015011          FMG24   012465          G$OFFS= 000400
CCITT1= 000000          C$PNTS= 000016          EMG36   015050          FMG25   012532          G$OFSI= 000376
CHLEN   031650          C$PNTX= 000015          EMG37   015102          FMG26   012575          G$PRMA= 000001
COUNTE  002326          C$QIO = 000377          EMG38   015114          FMG27   012671          G$PRMD= 000002
CPU     002312          C$RDBU= 000007          EMG39   015143          FMG28   012754          G$PRML= 000000
CR    = 000015          C$REFG= 000047          EMG4    013430          FMG29   013075          G$RADA= 000140
CRCHI = 000266          C$RESE= 000033          EMG40   015175          FMG3    011140          G$RADB= 000000
CRCLO = 000332          C$REVI= 000003          EMG5    013455          FMG30   013170          G$RADD= 000040
CRC16 = 001400          C$RFLA= 000021          EMG6    013510          FMG4    011212          G$RADL= 000120
CSR0    002270          C$RPT = 000025          EMG7    013545          FMG5    011257          G$RAL0= 000020
CSR1    002300          C$SEFG= 000046          EMG8    013563          FMG6    011270          G$XFER= 000004
CSR2    002272          C$SPRI= 000041          EMG9    013577          FMG7    011273          G$YES = 000010
CSR3    002302          C$SVEC= 000037          EMT0    020040          FMG8    011337          HEADER  002340
CSR4    002274          C$TPRI= 000013          END     016122          FMG9    011402          HELP  = 000000
CSR5    002304          DATA    002330          ERR   = 100000          FMODEM  005710          HOE   = 100000 G
CSR6    002276          DDCMP   002650          ERRG1   006532 G        FMODE0  005775          IBE   = 010000 G
CSR7    002306          DDCMP1= 000006          ERRG10  007352 G        FMODE1  006024          IC    = 040000
CTS   = 020000          DDCMP2= 000015          ERRG11  007452 G        FMODE2  006053          IDLE  = 004000
C$AU  = 000052          DDMSG   002656          ERRG12  010074 G        FMODE3  006137          IDU   = 000040 G
C$AUTO= 000061          DFPTBL  002254 G        ERRG13  010152 G        FMODE4  006146          IER   = 020000 G
```

SYMBOL TABLE

```
IPCR    002342          L$HIME  002120 G        L10042  020704          L10133  035264          RABORT= 002000
IPCSAR  002344          L$HPCP  002016 G        L10043  021014          L10134  035436          RCOUNT  002500
IRDSR   002350          L$HP    002022 G        L10044  021124          L10135  035612          RCVBUF  003273
IRXCSR  002346          L$HW    002254 G        L10045  021204          L10136  035774          RCVEC   002264
ISR     = 000100 G      L$ICP   002104 G        L10046  021550          L10137  036156          RDATA   016544 G
IXE     = 004000 G      L$INIT  015246 G        L10047  021376          L10140  036360          RDATA2  016776 G
I$AU    = 000041        L$LADP  002026 G        L10050  021546          L10141  036554          RDATRY= 000200
I$AUTO= 000041          L$LAST  040546 G        L10051  022002          L10142  036756          RDSR    = 002272
I$CLN   = 000041        L$LOAD  002100 G        L10052  021650          L10143  037134          REG     002374
I$DU    = 000041        L$LUN   002074 G        L10053  022000          L10144  037406          REOM    = 001000
I$HRD   = 000041        L$MREV  002050 G        L10054  022160          L10145  037702          RESET   = 000001
I$INIT= 000041          L$NAME  002000 G        L10055  022412          L10146  040200          RETURN= 000207
I$MOD   = 000041        L$PRIO  002042 G        L10056  022710          L10147  040244          RFLAG   002376
I$MSG   = 000041        L$PROT  015240 G        L10057  023716          MAINT   002356          RINT    016414 G
I$PROT= 000040          L$PRT   002112 G        L10060  023146          MASK    004514          RL      = 000001
I$PTAB= 000041          L$REPP  002062 G        L10061  023444          MCFLAG  002360          ROVER   = 004000
I$PWR   = 000041        L$REV   002010 G        L10062  023714          MM      = 000010        RR      = 010000
I$RPT   = 000041        L$SPC   002056 G        L10063  025032          MMASK   006300          RSAVE   002400
I$SEG   = 000041        L$SPCP  002020 G        L10064  024214          MODE    002362          RSIZE   = 000400
I$SETU= 000041          L$SPTP  002024 G        L10065  024524          MODEM   002444          RSOM    = 000400
I$SRV   = 000041        L$STA   002030 G        L10066  025030          NESTPC  002364          RSTARY= 002000
I$SUB   = 000041        L$TEST  002114 G        L10067  025276          NEWST   015422          RTS     = 000004
I$TST   = 000041        L$TIML  002014 G        L10070  025566          NOERR   = 003400        RXACT   = 004000
J$JMP   = 000167        L$UNIT  002012 G        L10071  026476          NONE1   = 001000        RXCSR   = 002270
LENGTH  002352          L10000  002264          L10072  025712          NONE2   = 003000        RXENA   = 000020
LF      = 000012        L10001  006556          L10073  025770          NXM     017534 G        RXINI   002402
LL      = 000010        L10002  006672          L10074  026046          NXMFLG  002366          RXINIT  002404
LOCATE  017766 G        L10003  006750          L10075  026166          ONE     = 010000        RXITEN= 000100
LOE     = 040000 G      L10004  007050          L10076  026306          OVER    002370          RXMINI  002406
LOGDEV  002354          L10005  007150          L10077  026446          O$APTS= 000000          SAVE    002410
LOOP    = 020000        L10006  007250          L10100  027602          O$AU    = 000000        SAVTIM  002412
LOT     = 000010 G      L10007  007350          L10101  027000          O$BGNR= 000000          SECADR= 010000
L$ACP   002110 G        L10010  007450          L10102  027270          O$BGNS= 000000          SEVEN   = 070000
L$APT   002036 G        L10011  010072          L10103  027600          O$DU    = 000001        SF      = 000001
L$AUT   002070 G        L10012  010150          L10104  030512          O$ERRT= 000000          SFR     = 000400
L$AUTO  016312 G        L10013  010636          L10105  030104          O$GNSW= 000000          SIX     = 060000
L$CCP   002106 G        L10014  010722          L10106  030510          O$POIN= 000001          SQ      = 000040
L$CLEA  016376 G        L10015  010746          L10107  031036          O$SETU= 000000          SSYNCH= 020000
L$CO    002032 G        L10017  016122          L10110  030674          PATCH   040474          STARES  002320
L$DEPO  002011 G        L10020  016374          L10111  031034          PCR     = 002304        STARST  015416
L$DESC  003702 G        L10021  016412          L10112  031210          PCSAR   = 002272        START   002414
L$DESP  002076 G        L10022  016542          L10113  031420          PNT     = 001000 G      SUBRPC  002416
L$DEVP  002060 G        L10023  016774          L10114  031646          PRI     = 002000 G      SVCGBL= 000000
L$DISP  002124 G        L10024  017046          L10115  032036          PRI00   = 000000 G      SVCINS= 000001
L$DLY   002116 G        L10025  017154          L10116  032222          PRI01   = 000040 G      SVCSUB= 000001
L$DTP   002040 G        L10026  017326          L10117  032406          PRI02   = 000100 G      SVCTAG= 000001
L$DTYP  002034 G        L10027  017416          L10120  032572          PRI03   = 000140 G      SVCTST= 000001
L$DU    017544 G        L10030  017532          L10121  032762          PRI04   = 000200 G      SW00    = 000001
L$DUT   002072 G        L10031  017542          L10122  033150          PRI05   = 000240 G      SW01    = 000002
L$DVTY  003674 G        L10032  017572          L10123  033566          PRI06   = 000300 G      SW02    = 000004
L$EF    002052 G        L10033  017764          L10124  033346          PRI07   = 000340 G      SW03    = 000010
L$ENVI  002044 G        L10034  020036          L10125  033564          PROTO   = 040000        SW04    = 000020
L$ETP   002102 G        L10035  020456          L10126  033756          PSTACK  0C2372          SW05    = 000040
L$EXP1  002046 G        L10036  020364          L10127  034146          P1      040244          SW06    = 000100
L$EXP4  002064 G        L10037  020454          L10130  034544          P2      040256          SW07    = 000200
L$EXP5  002066 G        L10040  021206          L10131  034720          P3      040267          SW08    = 000400
L$HARD  040204 G        L10041  020574          L10132  035074          P4      040427          SW09    = 001000
```

```
CVDPVA0 DPV11 FUNC DIAG MACRO V03.01 17-JUN-80 16:09:09 PAGE 103-4                SEQ  206
SYMBOL TABLE
SW10  = 002000          T$EXCP= 000000          T1      017624 G        T26     033152 G        T9      022712 G
SW11  = 004000          T$FLAG= 000040          T10     023720 G        T26.1   033152          T9.1    022712
SW12  = 010000          T$GMAN= 000000          T10.1   023720          T26.2   033350          T9.2    023150
SW13  = 020000          T$HILI= 000004          T10.2   024216          T27     033570 G        T9.3    023446
SW14  = 040000          T$LAST= 000001          T10.3   024526          T28     033760 G        UAM   = 000200 G
SW15  = 100000          T$LOLI= 000000          T11     025034 G        T29     034150 G        VRCE  = 002400
SYN   = 000226          T$LSYM= 010000          T12     025300 G        T3      020460 G        VRCO  = 002000
S$LSYM= 010000          T$LTNO= 000053          T13     025570 G        T3.1    020470          XCOUNT  002472
TBE   = 000004          T$NEST= 177777          T13.1   025636          T3.2    020576          XDATA   017156 G
TDSR  = 002276          T$NS0 = 000000          T13.2   025714          T3.3    020706          XDATA2  017330 G
TEMP    002420          T$NS1 = 000004          T13.3   025772          T3.4    021016          XDDCMP  017420 G
TEND    002422          T$NS2 = 000002          T13.4   026050          T3.5    021126          XINT    017050 G
TEOM  = 001000          T$NS3 = 000003          T13.5   026170          T30     034546 G        XMITD   002476
TERR  = 100000          T$PTNU= 000000          T13.6   026310          T31     034722 G        XMTBUF  002673
TFLAG   002424          T$SAVL= 177777          T14     026500 G        T32     035076 G        XMTVEC  002266
TGA   = 004000          T$SEGL= 177777          T14.1   026512          T33     035266 G        XTYPE   002470
THREE = 030000          T$SEK0= 010002          T14.2   027002          T34     035440 G        X$ALWA= 000000
TIMEO   002426          T$SUBN= 000000          T14.3   027272          T35     035614 G        X$FALS= 000040
TIMER   002430          T$TAGL= 177777          T15     027604 G        T36     035776 G        X$OFFS= 000400
TM    = 000040          T$TAGN= 010150          T15.1   027604          T37     036160 G        X$TRUE= 000020
TOGGLE  002432          T$TEMP= 000000          T15.2   030106          T38     036362 G        $BUFRS  004316
TSOM  = 000400          T$TEST= 000053          T16     030514 G        T39     036556 G        $CCITT  002502
TSTART  002434          T$TSTM= 177777          T16.1   030514          T4      021210 G        $CHECK  005134
TURN    002310          T$TSTS= 000001          T16.2   030676          T4.1    021210          $CHK1   005264
TWO   = 020000          T$$AUT= 010020          T17     031040 G        T4.2    021400          $DATA   004526
TXABO = 002000          T$$CLE= 010021          T18     031212 G        T40     036760 G        $DATA1  004700
TXACT = 000002          T$$DU = 010032          T19     031422 G        T41     037136 G        $DLAY   006464
TXCSR = 002274          T$$HAR= 010147          T2      020234 G        T42     037410 G        $GO     004714
TXENA = 000020          T$$HW = 010000          T2.1    020234          T43     037704 G        $LSTIN= 000001
TXIE  = 000100          T$$INI= 010017          T2.2    020366          T5      021552 G        $LSTTA= 000001
TXINI   002436          T$$MSG= 010015          T20     031672 G        T5.1    021552          $MODEM  005332
TXINIT  002440          T$$PRO= 010016          T21     032040 G        T5.2    021652          $RESET  004136
TXMINI  002442          T$$SEG= 010002          T22     032224 G        T6      022004 G        $SPEED  006402
T$ARGC= 000001          T$$SRV= 010034          T23     032410 G        T7      022162 G        $TURN   006324
T$CODE= 003130          T$$SUB= 010125          T24     032574 G        T8      022414 G        $WAIT   003724
T$ERRN= 000132          T$$TES= 010146          T25     032764 G

. ABS.  040546      000
        000000      001
ERRORS DETECTED:  0

VIRTUAL MEMORY USED:  22664 WORDS  ( 89 PAGES)
DYNAMIC MEMORY AVAILABLE FOR  69 PAGES
CVDPVA.BIN,DM0:CVDPVA.SEQ/C=#SVC34R.MLB,CVDPVA.P11
```

CROSS REFERENCE TABLE (CREF V01-05)

```
$BUFRS  29-31#  72-45   72-97   73-35   73-59   74-33   75-31   76-24   77-33   78-34   79-34   80-33   81-34   83-35
        84-42   84-72   85-34   86-34   87-26   88-31   89-31   90-33   91-31   93-33   94-32   95-32   96-35   97-34
        98-35   99-32
$CCITT  22-129#  72-38   72-90   73-28   73-52   74-24   75-24   76-22   77-26   78-25   79-25   80-25   81-27   83-28
        84-35   84-66   85-26   86-26   88-24   89-24   90-26   91-24   93-26   94-25   95-25   96-27   97-26   98-27
        99-25   101-33  101-51  102-32  102-51
$CHECK  31-32#  72-51   72-103  72-142  74-39   75-37   77-39   78-40   79-40   80-39   87-97   88-37   89-37   90-39
        91-37   93-39   94-38   95-38   96-41   97-40   98-41   99-38
$CHK1   31-61#  31-66   100-51  100-56  101-54  102-54
$DATA   30-41#  72-48   72-67   72-100  72-119  72-139  73-38   73-62   74-36   75-34   76-38   77-36   78-37   79-37
        80-36   81-37   83-38   84-46   84-79   85-37   86-37   88-34   89-34   90-36   91-34   93-36   94-35   95-35
        96-38   97-37   98-38   99-35
$DATA1  30-58   30-63#  100-44  101-41  102-40
$DLAY   35-2?#  57-60   60-37   62-45   63-49   64-188  68-23   68-30   68-35   68-40   68-50   69-47   69-67   69-87
        69-107  69-132  69-157
$GO     30-61   30-66#
$LSTIN  17-21#
$LSTTA  17-22#
$MODEM  32-28#  88-39   89-39   90-41   91-39   93-41   94-40   95-40   96-43   97-42   98-43   99-40
$RESET  28-22#  54-27   56-22   58-18   58-52   58-69   59-15   59-32   60-12   62-20   63-16   63-59   64-32   64-84
        64-156  65-17   65-71   65-131  66-14   66-52   68-19   69-38   69-58   69-79   69-98   69-123  69-148  69-174
        70-22   70-60   70-70   70-108  70-118  70-152  72-28   72-56   72-79   72-108  72-129  73-19   73-46   74-15
        75-14   76-27   77-17   78-14   79-14   80-14   81-17   83-18   84-24   84-55   85-15   86-15   87-15   88-15
        89-15   90-15   91-15   93-17   94-15   95-15   96-15   97-15   98-15   99-15   100-17  101-13  102-13
$SPEED  34-30#  87-13   88-13   89-13   90-13   91-13   93-15   94-13   95-13   96-13   97-13   98-13   99-13   100-15
$TURN   33-28#  68-16   69-24   70-17
$WAIT   27-26#  58-26   58-38   58-60   59-41   59-45   62-27   62-32   62-37
ABC     76-44   76-59#
ABORT   22-52#  40-18*  46-33   64-160*  64-207*  65-138*  65-184*
ACOUNT  22-146#  87-22
ADR     21-8#
ALL     21-90#
ALPHA   22-145#  22-146  87-21
APA     21-79#  29-39   72-83   94-19
ASSEMB  17-15   17-15
BIT0    21-8#   21-36   21-37   21-104  29-52   47-30   56-26   56-64   56-92   56-120
BIT00   21-8    21-8#
BIT01   21-8    21-8#
BIT02   21-8    21-8#
BIT03   21-8    21-8#
BIT04   21-8    21-8#
BIT05   21-8    21-8#
BIT06   21-8    21-8#
BIT07   21-8    21-8#
BIT08   21-8    21-8#
BIT09   21-8    21-8#
BIT1    21-8#   21-39   21-105  47-37
BIT10   21-8#   21-49   21-68   21-69   21-70   21-72   21-87   21-124  31-41
BIT11   21-8#   21-50   21-74   21-88   21-125
BIT12   21-8#   21-51   21-75   21-91   21-93   21-95   21-97
BIT13   21-8#   21-52   21-76   21-77   21-92   21-93   21-96   21-97
BIT14   21-8#   21-53   21-78   21-94   21-95   21-96   21-97
BIT15   21-8#   21-54   21-79   21-99   21-127  21-137
BIT2    21-8#   21-40   21-106
BIT3    21-8#   21-41   21-107  21-116
BIT4    21-8#   21-42   21-108  21-117
```

CROSS REFERENCE TABLE (CREF V01-05)

```
BIT5    21-8#   21-43   21-109  21-110
BIT6    21-8#   21-44   21-112
BIT7    21-8#   21-46
BIT8    21-8#   21-47   21-66   21-67   21-69   21-70   21-85   21-122
BIT9    21-8#   21-48   21-67   21-70   21-71   21-72   21-86   21-123
BITS    22-53#  27-29*  27-39   27-45   27-47
BOE     21-8#
BOP     21-137# 72-30   72-81   73-21   74-17   75-16   76-15   77-19   81-19   83-20   87-17   88-17   89-17   90-17
        91-17   93-19   94-17   95-17   102-19
C$AU    17-15#
C$AUTO  17-15#  41-27
C$BRK   17-15#  27-41   30-81
C$BSEG  17-15#  72-27   72-55   72-78   72-107  72-128
C$BSUB  17-15#  54-26   54-56   56-25   56-55   56-9?   56-111  56-138  58-17   58-51   59-14   59-31   64-31   64-83
        64-155  65-16   65-70   65-130  69-37   6.      69-78   69-97   69-122  69-147  70-21   70-69   70-117  72-26
        ..-77   73-18   73-45   84-23   84-54
C$CEFG  17-15#
C$CLCK  17-15#
C$CLEA  17-15#  42-1*
C$CLOS  17-15#
C$CLP1  17-15#
C$CVEC  17-15#  30-112  30-113  40-28   41-24   53-47   60-44   63-62   63-63   65-65   65-66   65-122  65-123  65-183
        66-55   66-56   69-177  69-178  70-63   70-64   70-111  70-112  70-160  70-161
C$DCLN  17-15#  41-23   53-44
C$DODU  17-15#  41-22   53-43
C$DRPT  17-15#
C$DU    17-15#  51-13
C$EDIT  17-15#  18-11
C$ERDF  17-15#  27-46   28-37   30-89   30-93   30-100  31-48   31-55   31-72   32-35   53-56   54-50   54-71   56-48
        56-76   56-104  56-132  56-144  58-32   58-43   58-66   58-74   59-26   59-53   60-33   60-40   62-41   62-48
        62-51   63-44   63-54   63-57   64-54   64-67   64-72   64-77   64-107  64-117  64-124  64-130  64-138  64-148
        64-179  64-192  64-199  64-205  65-42   65-51   65-57   65-61   65-98   65-107  65-114  65-118  65-158  65-167
        65-173  65-179  66-43   66-49   68-45   68-65   69-50   69-70   69-90   69-110  69-116  69-135  69-141  69-160
        69-167  70-50   70-58   70-98   70-106  70-146  70-155  72-71   72-123  73-41   73-65   75-45   76-46   81-41
        83-42   84-50   84-88   85-40   86-40   87-43   87-58   87-79
C$ERHR  17-15#
C$ERRO  17-15#
C$ERSF  17-15#
C$ERSO  17-15#
C$ESCA  17-15#  54-28   56-23   58-19   58-27   58-39   58-46   58-53   58-61   58-70   58-77   59-16   59-33   59-42
        59-46   60-13   62-21   62-28   62-33   62-38   63-17   64-33   64-85   64-157  65-18   65-72   65-132  66-15
        68-20   69-39   69-59   69-80   69-99   69-124  69-149  70-23   70-65   70-71   70-113  70-119  70-162  72-29
        72-49   72-52   72-57   72-80   72-101  72-104  72-109  72-124  72-130  72-140  72-143  73-20   73-47   74-16
        75-15   75-38   76-28   76-39   77-18   77-37   78-15   79-15   80-15   81-18   81-38   83-19   83-39   84-25
        84-47   84-56   84-80   85-16   86-16   87-3    88-16   89-16   90-16   91-16   93-18   94-16   95-16   96-16
        97-16   98-16   99-16   100-18  100-45  100-52  100-57  101-14  102-17
C$ESEG  17-15#  72-53   72-73   72-105  72-126  72-144
C$ESUB  17-15#  54-52   54-73   56-52   56-80   56-109  56-136  56-148  58-48   58-79   59-28   59-55   64-81   64-151
        64-208  65-68   65-126  65-187  69-54   69-74   69-94   69-119  69-144  69-170  70-67   70-115  70-164  72-74
        72-145  73-43   73-67   84-52   84-90
C$ETST  17-15#  53-49   54-75   56-150  58-82   59-58   60-46   62-54   63-65   64-212  65-190  66-60   68-67   69-181
        70-166  72-148  73-69   74-43   75-49   76-56   77-43   78-44   79-44   80-43   81-44   83-46   84-92   85-44
        86-44   87-102  88-42   89-42   90-44   91-42   93-43   94-43   95-43   96-46   97-45   98-46   99-43   100-61
        101-57  102-57
C$EXIT  17-15#  69-26   70-19
C$GETB  17-15#
C$GETW  17-15#
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CROSS REFERENCE TABLE (CREF V01-05)

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C$GMAN  17-15#
C$GPHR  17-15#  40-51
C$GPLO  17-15#
C$GPRI  17-15#
C$INIT  17-15#  40-126
C$INLP  17-15A
C$MANI  17-15#
C$MEM   17-15#
C$MSG   17-15#  37-10   37-20   37-25   37-32   37-39   37-45   37-51   37-57   37-76   37-81   37-123  37-131  37-135
C$OPEN  17-15#
C$PNTB  17-15#  27-49   28-48   32-36   32-40   32-44   32-45   32-46   32-55   32-58   32-70   32-73   37-9    37-16
        37-18   37-19   37-23   37-24   37-29   37-30   37-31   37-36   37-37   37-38   37-42   37-43   37-44   37-48
        37-49   37-50   37-54   37-55   37-56   37-63   37-65   37-66   37-67   37-68   37-69   37-70   37-71   37-72
        37-73   37-74   37-75   37-79   37-80   37-87   37-93   37-99   37-100  37-101  37-108  37-109  37-110  37-111
        37-112  37-116  37-117  37-118  37-121  37-128  37-130  37-134  40-57   40-86   69-111  69-136  69-161  69-162
        70-52   70-100  70-148  70-150
C$PNTF  17-15#  51-11
C$PNTS  17-15#
C$PNTX  17-15#  33-33   34-37   53-42   53-59   56-145  101-46  02-45
C$QIO   17-15#
C$RDBU  17-15#
C$REFG  17-15#  40-30   40-32   40-34   40-36
C$RESE  17-15#  17-15#  51-10   54-59
C$REVI  17-15#  18-11
C$RFLA  17-15#
C$RPT   17-15#
C$SEFG  17-15#
C$SPRI  17-15#  30-56   40-10   60-18   60-42   63-25   63-60   64-38   64-91   64-163  65-26   65-63   65-82   65-120
        65-142  65-181  66-21   66-53   69-30   69-175  70-31   70-61   70-79   70-109  70-127  70-158  100-40  101-38
        102-37
C$SVEC  17-15#  30-54   30-55   41-10   53-22   60-17   63-23   63-24   64-37   64-90   64-162  65-24   65-25   65-80
        65-81   65-140  65-141  66-19   66-20   69-29   70-29   70-30   70-77   70-78   70-125  70-126  100-38  100-39
        101-36  101-37  102-35  102-36
C$TPRI  17-15#
CCITT0  21-66#  72-82   83-21   88-18   90-18   94-18   95-18
CCITT1  21-65#  72-31   73-22   74-18   75-17   77-20   81-20   87-19   89-18   91-18   93-20   102-15
CHLEN   76-33   76-58#
COUNTE  22-54#  45-31*  101-19*  102-18*
CPU     22-34#  34-31   40-93*  40-117  101-44  102-43
CR      21-138# 103-24  103-25
CRC16   21-67#  84-27   84-58   98-18   99-18   100-22  101-16
CRCHI   21-141# 84-85
CRCLO   21-140# 84-83
CSR0    22-14#  22-23   37-18   37-30   37-30   37-66   37-66   37-117  37-117  40-59*  40-61   41-12   53-33   53-59
CSR1    22-18#  28-46   40-61*  40-62*
CSR2    22-15#  22-24   22-26   37-18   40-63*  40-64*  40-68   53-35
CSR3    22-19#  40-68*  40-69*
CSR4    22-16#  22-27   37-19   37-37   37-37   37-68   37-68   37-111  37-111  40-70*  40-71*  40-74   53-37
CSR5    22-20#  22-29   37-43   40-74*  40-76*
CSR6    22-17#  22-28   37-19   37-49   37-49   37-72   37-72   40-77*  40-78*  40-80   53-39   56-141
CSR7    22-21#  37-55   37-55   37-74   37-74   40-80*  40-81*  47-36*  56-113*  56-114  56-117*  56-118  56-123*  56-124
        56-126*  56-134*  56-140*
CTS     21-52#  32-87   37-86   68-24
DATA    22-55#  46-28*  46-31   46-42*  66-36
DDCMP   22-152# 22-157  100-33  100-48
DDCMP1  22-157# 100-34  100-43  100-49
DDCMP2  22-161# 49-42   100-43  100-55
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CROSS REFERENCE TABLE (CREF V01-05)

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DDMSG    22-159#  22-161
DFPTBL   20-8#
DIAGMC   17-15    17-15
DM       21-48#   32-87    37-98    68-41
DSCNG    21-54#   32-87
DSITEN   21-43#   40-112   43-37    44-29    44-34    69-64    69-104   69-129   69-154   70-40    70-88    70-136   101-40   101-42
         102-39   102-41
DTR      21-39#   32-87    37-90    37-92    40-104   40-109   68-28    68-49    68-55    69-44    69-64    69-85    69-129   70-75
ESEND    17-15#
ESLOAD   17-15#   18-11
ECOUNT   22-114#  29-64*   44-66    84-45*   84-77*   100-43*
EF.CON   21-8#    40-36
EF.NEW   21-8#    40-34
EF.PUR   21-8#
EF.RES   21-8#    40-32
EF.STA   21-8#    40-30
EMG0     37-170#  54-71
EMG1     27-46    37-171#  64-117   64-138   64-192   87-58
EMG10    37-180#  60-40
EMG11    37-181#  64-77
EMG12    37-182#  62-41    64-54    64-107   64-179   65-42    65-98    65-158
EMG13    37-183#  62-48    63-54
EMG14    37-184#  62-51
EMG15    37-185#  63-44    66-49
EMG16    37-186#  63-57
EMG17    37-187#  64-67    65-57
EMG18    37-188#  64-72    64-130   64-148   64-205   65-61    65-118   65-179
EMG19    37-189#  64-124   65-114
EMG2     30-89    37-172#
EMG20    37-190#  64-199   65-173
EMG21    37-191#  65-51    65-107   65-167
EMG22    37-192#  68-45    68-65
EMG23    37-193#  69-50    69-70    69-90
EMG24    37-194#  69-110   69-135   69-160   70-50    70-98    70-146
EMG25    31-55    37-195#
EMG26    31-72    37-196#
EMG3     28-37    37-173#
EMG30    30-93    37-197#  87-43
EMG31    30-100   37-198#  87-79
EMG32    37-199#  73-41
EMG33    37-200#  73-65    75-45
EMG34    37-201#
EMG35    37-202#  72-71    72-123
EMG36    37-203#  76-46
EMG37    31-48    37-204#  84-88
EMG38    37-205#  81-41    83-42    84-50
EMG39    37-206#  85-40    86-40
EMG4     37-174#  54-50    56-48    56-76    56-104   56-132   56-144
EMG40    32-35    37-207#  69-116   69-141   69-167   70-58    70-106   70-155
EMG5     37-175#  58-32    58-66
EMG6     37-176#  58 43    58-74
EMG7     37-177#  59-26
EMG8     37-178#  59-53
EMG9     37-179#  60-33    66-43
EM10     53-56    53-62#
END      40-38    40-125#
ERR      21-99#   44-59    87-73
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CROSS REFERENCE TABLE (CREF V01-05)

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ERRG1    31-48   32-35   37-8#
ERRG10   37-53#  56-132
ERRG11   28-37   37-60#  5.-71
ERRG12   27-46   37-78#
ERRG13   37-83#  68-45
ERRC14   31-55   37-125#
ERRG15   37-133# 68-65
ERRG2    30-89   30-93   30-100  37-13#  59-53   60-33   60-40   62-41   62-48   62-51   63-44   63-54   63-57   64-54
         64-67   64-72   64-77   64-107  64-117  64-124  64-130  64-138  64-148  64-179  64-192  64-199  6 -205  65-42
         65-51   65-57   65-61   65-98   65-107  65-114  65-118  65-158  65-167  65-173  65-179  66-43   66-49   69-50
         69-70   69-90   69-110  69-135  69-160  70-50   70-98   70-146
ERRG3    31-72   57-22#
ERRG4    37-28#  56-48
ERRG7    37-35#  54-50   58-32   58-43   58-66   58-74   59-26
ERRG8    37-41#  56-76
ERRG9    37-47#  56-104  56-144
ERROR    22-56#  30-46*  30-102* 32-31   40-13*
EVL      21-8#
EXADD    21-117# 29-50
EXCON    21-116# 29-57
EXERR    22-57#  30-87   30-98   72-47*  72-65*  72-99*  72-117* 72-138* 73-37*  73-61*  74-35*  75-33*  76-37*  77-35*
         78-36*  79-36*  80-35*  81-36*  83-37*  84-44*  84-75*  85-36*  86-36*  88-33*  89-33*  90-35*  91-33*  93-35*
         94-34*  95-34*  96-37*  97-36*  98-37*  99-34*  100-42* 101-24* 102-23*
FSAU     17-15#
FSAUTO   17-15#  41-8    41-27
FSBGN    17-15#  17-18   37-8    37-13   37-22   37-28   37-35   37-41   37-47   37-53   37-60   37-78   37-83   37-125
         37-133  39-8    40-8    41-8    42-9    43-30   44-24   45-20   46-22   47-26   48-18   49-22   50-18   51-8
         53-20   53-49   53-52   54-25   54-26   54-26   54-28   54-52   54-56   54-5.   54-73   54-75   56-21   56-23
         56-25   56-25   56-52   56-55   56-55   56-80   56-82   56-82   56-109  56-111  56-111  56-136  56-138  56-138
         56-148  56-150  58-15   58-17   58-17   58-19   58-27   58-39   58-46   58-48   58-51   58-51   58-53   58-61
         58-70   58-77   58-79   58-82   59-12   59-14   59-14   59-16   59-28   59-31   59-31   59-33   59-42   59-46
         59-55   59-58   60-10   60-13   60-46   62-18   62-21   62-28   62-33   62-38   62-54   63-13   63-17   63-65
         64-29   64-31   64-31   64-33   64-81   64-83   64-83   64-85   64-151  64-155  64-155  64-157  64-208  64-212
         65-13   65-16   65-16   65-18   65-68   65-70   65-70   65-72   65-126  65-130  65-130  65-132  65-187  65-190
         66-12   66-15   66-60   68-15   68-20   68-67   69-23   69-26   69-37   69-37   69-39   69-54   69-57   69-57
         69-59   69-74   69-78   69-78   69-80   69-94   69-97   69-97   69-99   69-119  69-122  69-122  69-124  69-144
         69-147  69-147  69-149  69-170  69-181  70-16   70-19   70-21   70-21   70-23   70-65   70-67   70-69   70-69
         70-71   70-113  70-115  70-117  70-117  70-119  70-162  70-164  70-166  72-24   72-26   72-26   72-27   72-29
         72-49   72-52   72-55   72-57   72-74   72-77   72-77   72-78   72-80   72-101  72-104  72-107  72-109  72-124
         72-128  72-130  72-140  72-143  72-145  72-148  73-17   73-18   73-18   73-20   73-43   73-45   73-45   73-47
         73-67   73-69   74-13   74-16   74-43   75-12   75-15   75-38   75-49   76-13   76-28   76-39   76-56   77-15
         77-18   77-37   77-43   78-12   78-15   78-44   79-12   79-15   79-44   80-12   80-15   80-43   81-15   81-18
         81-38   81-44   83-15   83-19   83-39   83-46   84-21   84-23   84-23   84-25   84-47   84-52   84-54   84-54
         84-56   84-80   84-90   84-92   85-12   85-16   85-44   86-12   86-16   86-44   87-12   87-16   87-102  88-12
         88-16   88-42   89-12   89-16   89-42   90-12   90-16   90-44   91-12   91-16   91-42   93-14   93-18   93-43
         94-12   94-16   94-43   95-12   95-16   95-43   96-12   96-16   96-46   97-12   97-16   97-45   98-12   98-16
         98-46   99-12   99-16   99-43   100-14  100-18  100-45  100-52  100-57  100-61  101-12  101-14  101-57  102-12
         102-14  102-57  103-13  103-39
FSCLEA   17-15#  42-9    42-14
FSDU     17-15#  51-8    51-13
FSEND    17-15   17-15   17-15   17-15   17-15   17-15   17-15   17-15   17-15   17-15   17-15   17-15   17-15   17-15
         17-15   17-15   17-15#  17-18   37-10   37-20   37-25   37-32   37-39   37-45   37-51   37-57   37-76   37-81
         37-123  37-131  37-135  40-126  41-27   42-14   43-59   44-74   45-38   46-44   47-66   48-39   49-49   50-22
         51-13   53-20   53-20   53-20   53-49   53-49   53-60   54-25   54-25   54-25   54-26   54-26   54-28   54-52
         54-52   54-56   54-56   54-73   54-73   54-75   54-75   56-21   56-21   56-21   56-23   56-25   56-25   56-52
         56-52   56-55   56-55   56-80   56-80   56-82   56-82   56-109  56-109  56-111  56-111  56-136  56-136  56-138
         56-138  56-148  56-148  56-150  56-150  58-15   58-15   58-15   58-17   58-17   58-19   58-27   58-39   58-46
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CROSS REFERENCE TABLE (CREF V01-05)

	58-48	58-48	58-51	58-51	58-53	58-61	58-70	58-77	58-79	58-79	58-82	58-82	59-12	59-12
	59-12	59-14	59-14	59-16	59-28	59-28	59-31	59-31	59-33	59-42	59-46	59-55	59-55	59-58
	59-58	60-10	60-10	60-10	60-13	60-46	60-46	62-18	62-18	62-18	62-21	62-28	62-33	62-38
	62-54	62-54	63-13	63-13	63-13	63-17	63-65	63-65	64-29	64-29	64-29	64-31	64-31	64-33
	64-81	64-81	64-83	64-83	64-85	64-151	64-151	64-155	64-155	64-157	64-208	64-208	64-212	64-212
	65-13	65-13	65-13	65-16	65-16	65-18	65-68	65-68	65-70	65-70	65-72	65-126	65-126	65-130
	65-130	65-132	65-187	65-187	65-190	65-190	66-12	66-12	66-12	66-15	66-60	66-60	68-15	68-15
	68-15	68-20	68-67	68-67	69-23	69-23	69-23	69-26	69-37	69-37	69-39	69-54	69-54	69-57
	69-57	69-59	69-74	69-74	69-78	69-78	69-80	69-94	69-94	69-97	69-97	69-99	69-119	69-119
	69-122	69-122	69-124	69-144	69-144	69-147	69-147	69-149	69-170	69-170	69-181	69-181	70-16	70-16
	70-16	70-19	70-21	70-21	70-23	70-65	70-67	70-67	70-69	70-69	70-71	70-113	70-115	70-115
	70-117	70-117	70-119	70-162	70-164	70-164	70-166	70-166	72-24	72-24	72-24	72-26	72-26	72-29
	72-49	72-52	72-53	72-57	72-73	72-74	72-74	72-77	72-77	72-80	72-101	72-104	72-105	72-109
	72-124	72-126	72-130	72-140	72-143	72-144	72-145	72-145	72-148	72-148	73-17	73-17	73-17	73-18
	73-18	73-20	73-43	73-43	73-45	73-45	73-47	73-67	73-67	73-69	73-69	74-13	74-13	74-13
	74-16	74-43	74-43	75-12	75-12	75-12	75-15	75-38	75-49	75-49	76-13	76-13	76-13	76-28
	76-39	76-56	76-56	77-15	77-15	77-15	77-18	77-37	77-43	77-43	78-12	78-12	78-12	78-15
	78-44	78-44	79-12	79-12	79-12	79-15	79-44	79-44	80-12	80-12	80-12	80-15	80-43	80-43
	81-15	81-15	81-15	81-18	81-38	81-44	81-44	83-15	83-15	83-15	83-19	83-39	83-46	83-46
	84-21	84-21	84-21	84-23	84-23	84-25	84-47	84-52	84-52	84-54	84-54	84-56	84-80	84-90
	84-90	84-92	84-92	85-12	85-12	85-12	85-16	85-44	85-44	86-12	86-12	86-12	86-16	86-44
	86-44	87-12	87-12	87-12	87-16	87-102	87-102	88-12	88-12	88-12	88-16	88-42	88-42	89-12
	89-12	89-12	89-16	89-42	89-42	90-12	90-12	90-12	90-16	90-44	90-44	91-12	91-12	91-12
	91-16	91-42	91-42	93-14	93-14	93-14	93-18	93-43	3-43	94-12	94-12	94-12	94-16	94-43
	94-43	95-12	95-12	95-12	95-16	95-43	95-43	96-12	96-12	96-12	96-16	96-46	96-46	97-12
	97-12	97-12	97-16	97-45	97-45	98-12	98-12	98-12	98-16	98-46	98-46	99-12	99-12	99-12
	99-16	99-43	99-43	100-14	100-14	100-14	100-18	100-45	100-52	100-57	100-61	100-61	101-12	101-12
	101-12	101-14	101-57	101-57	102-12	102-12	102-12	102-14	102-57	102-57	103-20	103-39		
FSHARD	17-15#	103-13	103-20											
FSHW	17-15#	20-8	20-15											
FSINIT	17-15#	40-8	40-126											
FSJMP	17-15#	69-26	70-19											
FSMOD	17-15#	17-18	103-39											
FSMSG	17-15#	37-8	37-10	37-13	37-20	37-22	37-25	37-28	37-32	37-35	37-39	37-41	37-45	37-47
	37-51	37-53	37-57	37-60	37-76	37-78	37-81	37-83	37-123	37-125	37-131	37-133	37-135	
FSPROT	17-15#	39-8	39-14											
FSPWR	17-15#													
FSRPT	17-15#													
FSSEG	17-15#	72-27	72-53	72-55	3	72-78	72-105	72-107	72-126	72-128	72-144			
FSSOFT	17-15#													
FSSRV	17-15#	43-30	43-59	44-24	44-74	45-20	45-38	46-22	46-44	47-26	47-66	48-18	48-39	49-22
	49-49	50-18	50-22	53-52	53-60									
FSSUB	17-15#	54-26	54-52	54-56	54-73	56-25	56-52	56-55	56-80	56-82	56-109	56-111	56-136	56-138
	56-148	58-17	58-48	58-51	58-79	59-14	59-28	59-31	59-55	64-31	64-81	64-83	64-151	64-155
	64-208	65-16	65-68	65-70	65-126	65-130	65-187	69-37	69-54	69-57	69-74	69-78	69-94	69-97
	69-119	69-122	69-144	69-147	69-170	70-21	70-67	70-69	70-115	70-117	70-164	72-26	72-74	72-77
	72-145	73-18	73-43	73-45	73-67	84-23	84-52	84-54	84-90					
FSSW	17-15#													
FSTEST	17-15#	53-20	53-49	54-25	54-75	56-21	56-150	58-15	58-82	59-12	59-58	60-10	60-46	62-18
	62-54	63-13	63-65	64-29	64-212	65-13	65-190	66-12	66-60	68-15	68-67	69-23	69-181	70-16
	70-166	72-24	72-148	73-17	73-69	74-13	74-43	75-12	75-49	76-13	76-56	77-15	77-43	78-12
	78-44	79-12	79-44	80-12	80-43	81-15	81-44	83-15	83-46	84-21	84-92	85-12	85-44	86-12
	86-44	87-12	87-102	88-12	88-42	89-12	89-42	90-12	90-44	91-12	91-42	93-14	93-43	94-12
	94-43	95-12	95-43	96-12	96-46	97-12	97-45	98-12	98-46	99-12	99-43	100-14	100-61	101-12
	101-57	102-12	102-57											
FINIT1	40-57	40-127#												
FINIT2	40-86	40-128#												

CROSS REFERENCE TABLE (CREF V01-05)

```
FIVE     21-95#
FLAG     22-58#   40-14*   60-38
FMDROP   51-11    51-16#
FMG0     33-33    37-137#
FMG1     37-18    37-138#
FMG10    37-37    37-68    37-111   37-147#
FMG11    37-43    37-70    37-148#
FMG12    37-49    37-72    37-149#
FMG13    37-55    37-74    37-150#
FMG14    37-80    37-151#
FMG15    37-117   37-152#
FMG16    37-118   37-153#
FMG17    37-87    37-154#
FMG18    37-93    37-155#
FMG19    37-99    37-156#
FMG2     37-19    37-139#
FMG20    37-108   37-157#
FMG21    37-100   37-109   37-158#
FMG22    37-121   37-159#
FMG23    37-63    37-160#
FMG24    37-130   37-161#
FMG25    37-134   37-162#
FMG26    37-163#  69-111   69-136   69-161   70-52    70-100   70-148
FMG27    34-37    37-164#
FMG28    37-165#  101-46   102-45
FMG29    37-101   37-167#  69-162   70-150
FMG3     37-9     37-16    37-23    37-79    37-128   37-140#
FMG30    37-168#  56-145
FMG4     37-29    37-36    37-42    37-48    37-54    37-65    37-110   37-116   37-161#
FMG5     37-31    37-38    37-44    37-50    37-56    37-67    37-69    37-71    37-73    37-75    37-112   37-142#
FMG6     32-73    37-143#
FMG7     37-30    37-62    37-144#
FMG8     37-24    37-145#
FMG9     28-48    37-146#
FMODE0   32-44    32-78#
FMODE1   32-45    32-79#
FMODE2   32-46    32-80#
FMODE3   32-55    32-81#
FMODE4   32-58    32-82#
FMODE5   32-70    32-83#
FMODE6   32-40    32-84#
FMODEM   32-36    32-77#
FMS1     27-49    27-56#
FMT0     53-59    53-63#
FMT1     53-42    53-64#
FOUR     21-94#
FRSPAS   22-43#   40-25*   40-45*
FRSTIM   22-42#   40-22    40-24*
G$CNTO   17-15#
G$DELM   17-15#   35-29    59-18
G$DISP   17-15#
G$EXCP   17-15#
G$HILI   17-15#
G$LOLI   17-15#
G$NO     17-15#
G$OFFS   17-15#   103-15   103-16   103-17   103-18
G$OFSI   17-15#   103-15   103-16   103-17   103-18
```

CROSS REFERENCE TABLE (CREF V01-05)

```
G$PRMA  17-15#  103-15   103-16
G$PRMD  17-15#  103-17
G$PRML  17-15#  103-18
G$RADA  17-15#
G$RADB  17-15#
G$RADD  17-15#
G$RADL  17-15#  103-18
G$RADO  17-15#  103-15   103-16   103-17
G$XFER  17-15#
G$YES   17-15#  103-15   103-16   103-17   103-18
GETPRM  40-37    40-47#   40-52
HEADER  22-59#   47-48    47-52*   47-55*   49-39    49-41*   72-34*   72-59*   72-86*   72-111*  72-132*  73-24*   73-51*   74-20*
        75-20*   76-30*   77-22*   78-21*   79-21*   80-21*   81-23*   83-24*   84-31*   84-62*   85-22*   86-22*   88-20*   89-20*
        90-22*   91-20*   93-22*   94-21*   95-21*   96-23*   97-22*   98-23*   99-21*   100-20*
HELP    17-3#    17-36    18-13    19-10    24-26
HOE     21-8#
I$AU    17-15#
I$AUTO  17-15#   41-8#    41-27#
I$CLN   17-15#   42-9#    42-14#
I$DU    17-15#   51-8#    51-13#
I$HRD  103-13#  103-20#
I$INIT  17-15#   40-8#    40-126#
I$MOD   17-15#   17-18    17-18#   103-39   103-39#
I$MSG   17-15#   37-8#    37-10#   37-13#   37-20#   37-22#   37-25#   37-28#   37-32#   37-35#   37-39#   37-41#   37-45#   37-47#
        37-51#   37-53#   37-57#   37-60#   37-76#   37-78#   37-8 #   37-83#   37-123#  37-125#  37-131#  37-133#  37-135#
I$PROT  17-15#   39-8#
I$PTAB  17-15#
I$PWR   17-15#
I$RPT   17-15#
I$SEG   17-15#   53-20    54-25    54-26    54-56    56-21    56-25    56-55    56-82    56-111   56-138   58-15    58-17    58-51
        59-12    59-14    59-31    60-10    62-18    63-13    64-29    64-31    64-83    64-155   65-13    65-16    65-70    65-130
        66-12    68-15    69-23    69-37    69-57    69-78    69-97    69-122   69-147   70-16    70-21    70-69    70-117   72-24
        72-26    72-27#   72-53#   72-55#   72-73#   72-77    72-78#   72-105#  72-107#  72-126#  72-128#  72-144#  73-17    73-18
        73-45    74-13    75-12    76-13    77-15    78-12    79-12    80-12    81-15    83-15    84-21    84-23    84-54    85-12
        86-12    87-12    88-12    89-12    90-12    91-12    93-14    94-12    95-12    96-12    97-12    98-12    99-12    100-14
       101-12   102-12
I$SETU  17-15#
I$SRV   17-15#   43-30#   43-59#   44-24#   44-74#   45-20#   45-38#   46-22#   46-44#   47-26#   47-66#   48-18#   48-39#   49-22#
        49-49#   50-18#   50-22#   53-52#   53-60#
I$SUB   17-15#   53-20    54-25    54-26    54-26#   54-52    54-52#   54-52#   54-56    54-56#   54-73    54-73#   54-73#   56-21
        56-25    56-25#   56-52    56-52#   56-52#   56-55    56-55#   56-80    56-80#   56-80#   56-82    56-82#   56-109   56-109#
        56-109#  56-111   56-111#  56-136   56-136#  56-136#  56-138   56-138#  56-148   56-148#  56-148#  58-15    58-17    58-17#
        58-48    58-48#   58-48#   58-51    58-51#   58-79    58-79#   58-79#   59-12    59-14    59-14#   59-28    59-28#   59-28#
        59-31    59-31#   59-55    59-55#   59-55#   60-10    62-18    63-13    64-29    64-31    64-31#   64-81    64-81#   64-81#
        64-83    64-83#   64-151   64-151#  64-151#  64-155   64-155#  64-208   64-208#  64-208#  65-13    65-16    65-16#   65-68
        65-68#   65-68#   65-70    65-70#   65-126   65-126#  65-126#  65-130   65-130#  65-187   65-187#  65-187#  66-12    68-15
        69-23    69-37    69-37#   69-54    69-54#   69-54#   69-57    69-57#   69-74    69-74#   69-74#   69-78    69-78#   69-94
        69-94#   69-94#   69-97    69-97#   69-119   69-119#  69-119#  69-122   69-122#  69-144   69-144#  69-144#  69-147   69-147#
        69-170   69-170#   69-170#  70-16    70-21    70-21#   70-67    70-67#   70-67#   70-69    70-69#   70-115   70-115#  70-115#
        70-117   70-117#   70-164   70-164#  70-164#  72-24    72-26    72-26#   72-74    72-74#   72-74#   72-77    72-77#   72-145
        72-145#  72-145#   73-17    73-18    73-18#   73-43    73-43#   73-43#   73-45    73-45#   73-67    73-67#   73-67#   74-13
        75-12    76-13    77-15    78-12    79-12    80-12    81-15    83-15    84-21    84-23    84-23#   84-52    84-52#   84-52#
        84-54    84-54#   84-90    84-90#   84-90#   85-12    86-12    87-12    88-12    89-12    90-12    91-12    93-14    94-12
        95-12    96-12    97-12    98-12    99-12   100-14   101-12   102-12
I$TST   17-15#   53-20    53-20#   53-49    53-49#   53-49#   54-25    54-25#   54-26    54-28    54-56    54-75    54-75#   54-75#
        56-21    56-21#   56-23    56-25    56-55    56-82    56-111   56-138   56-150   56-150#  56-150#  58-15    58-15#   58-17
        58-19    58-27    58-39    58-46    58-51    58-53    58-61    58-70    58-77    58-82    58-82#   58-82#   59-12    59-12#
```

CROSS REFERENCE TABLE (CREF V01-05)

```
        59-14   59-16   59-31   59-33   59-42   59-46   59-58   59-58#  59-58#  60-10   60-10#  60-13   60-46   60-46#
        60-46#  62-18   62-18#  62-21   62-28   62-33   62-38   62-54   62-54#  62-54#  63-13   63-13#  63-17   63-65
        63-65#  63-65#  64-29   64-29#  64-31   64-33   64-83   64-85   64-155  64-157  64-212  64-212#  64-212#  65-13
        65-13#  65-16   65-18   65-70   65-72   65-130  65-132  65-190  65-190#  65-190#  66-12   66-12#  66-15   66-60
        66-60#  66-60#  68-15   68-15#  68-20   68-67   68-67#  68-67#  69-23   69-23#  69-26   69-37   69-39   69-57
        69-59   69-78   69-80   69-97   69-99   69-122  69-124  69-147  69-149  69-181  69-181#  69-181#  70-16   70-16#
        70-19   70-21   70-23   70-65   70-69   70-71   70-113  70-117  70-119  70-162  70-166  70-166#  70-166#  72-24
        72-24#  72-26   72-29   72-49   72-52   72-57   72-77   72-80   72-101  72-104  72-109  72-124  72-130  72-140
        72-143  72-148  72-148#  72-148#  73-17   73-17#  73-18   73-20   73-45   73-47   73-69   73-69#  73-69#  74-13
        74-13#  74-16   74-43   74-43#  74-43#  75-12   75-12#  75-15   75-38   75-49   75-49#  75-49#  76-13   76-13#
        76-28   76-39   76-56   76-56#  76-56#  77-15   77-15#  77-18   77-37   77-43   77-43#  77-43#  78-12   78-12#
        78-15   78-44   78-44#  78-44#  79-12   79-12#  79-15   79-44   79-44#  79-44#  80-12   80-12#  80-15   80-43
        80-43#  80-43#  81-15   81-15#  81-18   81-38   81-44   81-44#  81-44#  83-15   83-15#  83-19   83-39   83-46
        83-46#  83-46#  84-21   84-21#  84-23   84-25   84-47   84-54   84-56   84-80   84-92   84-92#  84-92#  85-12
        85-12#  85-16   85-44   85-44#  85-44#  86-12   86-12#  86-16   86-44   86-44#  86-44#  87-12   87-12#  87-16
        87-102  87-102#  87-102#  88-12   88-12#  88-16   88-42   88-42#  88-42#  89-12   89-12#  89-16   89-42   89-42#
        89-42#  90-12   90-12#  90-16   90-44   90-44#  90-44#  91-12   91-12#  91-16   91-42   91-42#  91-42#  93-14
        93-14#  93-18   93-43   93-43#  93-43#  94-12   94-12#  94-16   94-43   94-43#  94-43#  95-12   95-12#  95-16
        95-43   95-43#  95-43#  96-12   96-12#  96-16   96-46   96-46#  96-46#  97-12   97-12#  97-16   97-45   97-45#
        97-45#  98-12   98-12#  98-16   98-46   98-46#  98-46#  99-12   99-12#  99-16   99-43   99-43#  99-43#  100-14
       100-14#  100-18  100-45  100-52  100-57  100-61  100-61#  100-61#  101-12  101-12#  101-14  101-57  101-57#  101-57#
       102-12   102-12#  102-14  102-57  102-57#  102-57#
IBE     21-8#
IC      21-53#  32-87   37-92   68-31
IDLE    21-74#  73-49   79-19   96-21
IDU     21-8#
IER     21-8#
IPCR    22-60#  29-50   29-57   47-56   72-42*  72-62*  72-94*  72-114*  72-135*  73-32*  73-56*  74-28*  75-28*  76-33*
        77-30*  78-29*  78-31   79-29*  79-30   80-28*  80-29   81-31*  83-32*  84-38*  84-70*  85-29*  86-29*  88-28*
        89-28*  90-30*  91-28*  93-30*  94-29*  95-29*  96-30*  96-31   97-29*  97-30   98-30*  98-31   99-28*
IPCSAR  22-61#  29-39   29-44   29-46   31-41   72-31*  72-32*  72-41   72-61   72-82*  72-83*  72-93   72-113  72-134
        73-22*  73-31   73-48*  73-49*  73-55   74-18*  74-27   75-17*  75-18*  75-27   76-16*  76-31   77-20*  77-29
        78-17*  78-18*  78-19*  78-30   79-17*  79-18*  79-19*  79-31   80-17*  80-18*  80-19*  80-30   81-20*  81-21*
        81-30   83-21*  83-22*  83-31   84-27*  84-28*  84-29*  84-39   84-58*  84-59*  84-60*  84-69   85-18*  85-19*
        85-20*  85-31   86-18*  86-19*  86-20*  86-31   87-18*  87-19*  88-18*  88-27   89-18*  89-27   90-18*  90-19*
        90-20*  90-29   91-18*  91-27   93-20*  93-29   94-18*  94-19*  94-28   95-18*  95-19*  95-28   96-18*  96-19*
        96-20*  96-21*  96-32   97-18*  97-19*  97-20*  97-31   98-18*  98-19*  98-20*  98-21*  98-32   99-18*  99-19*
        99-29
IRDSR   22-63#  31-37   31-43   44-51*  44-54   44-59   73-39   73-63   75-40   75-42   76-43*  76-44   81-39   83-40
        84-48   85-38   86-38   87-65*  87-68   87-73   87-75
IRXCSR  22-62#  43-32*  43-39   43-48   44-26*  44-29   44-40   44-49   44-52   44-57   87-64*  87-66   87-71
ISR     21-8#
IXE     21-8#
J$JMP   17-15#
L$ACP   18-11#
L$APT   18-11#
L$AUT   18-11#
L$AUTO  18-11   41-8#
L$CCP   18-11#
L$CLEA  18-11   42-9#
L$CO    18-11#
L$DEPO  18-11#
L$DESC  18-11   24-18#
L$DESP  18-11#
L$DEVP  18-11#
L$DISP  18-11   19-8#
L$DLY   18-11#  35-29   59-18
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CROSS REFERENCE TABLE (CREF V01-05)

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LSDTP   18-11#
LSDTYP  18-11#
LSDU    18-11    51-8#
LSDUT   18-11#
LSDVTY  18-11    24-13#
LSEF    18-11#
LSENVI  18-11#
LSETP   18-11#
LSEXP1  18-11#
LSEXP4  18-11#
LSEXP5  18-11#
LSHARD  18-11    103-13   103-13#
LSHIME  18-11#
LSHPCP  18-11#
LSHPTP  18-11#
LSHW    18-11    20-8     20-8#
LSICP   18-11#
LSINIT  18-11    40-8#
LSLADP  18-11#
LSLAST  18-11    103-41#
LSLOAD  18-11#
LSLUN   18-11#
LSMREV  18-11#
LSNAME  18-11#
LSPRIO  18-11#
LSPROT  18-11    39-8#
LSPRT   18-11#
LSREPP  18-11#
LSREV   18-11#
LSSPC   18-11#
LSSPCP  18-11#
LSSPTP  18-11#
LSSTA   18-11#
LSTEST  18-11#   33-33    34-37
LSTIML  18-11#
LSUNIT  18-11#   40-49
L10000  20-8     20-15#
L10001  37-10#
L10002  37-20#
L10003  37-25#
L10004  37-32#
L10005  37-39#
L10006  37-45#
L10007  37-51#
L10010  37-57#
L10011  37-76#
L10012  37-81#
L10013  37-123#
L10014  37-131#
L10015  37-135#
L10017  40-126#
L10020  41-27#
L10021  42-14#
L10022  43-59#
L10023  44-74#
L10024  45-38#
L10025  46-44#
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CROSS REFERENCE TABLE (CREF V01-05)

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L10026  47-66#
L10027  48-39#
L10030  49-49#
L10031  50-22#
L10032  51-13#
L10033  53-49#
L10034  53-60#
L10035  54-28    54-75#
L10036  54-52#
L10037  54-73#
L10040  56-23    56-150#
L10041  56-52#
L10042  56-80#
L10043  56-109#
L10044  56-136#
L10045  56-148#
L10046  58-19    58-27    58-39    58-46    58-53    58-61    58-70    58-77    58-82#
L10047  58-48#
L10050  58-79#
L10051  59-16    59-33    59-42    59-46    59-58#
L10052  59-28#
L10053  59-55#
L10054  60-13    60-46#
L10055  62-21    62-28    62-33    62-38    62-54#
L10056  63-17    63-65#
L10057  64-33    64-85    64-157   64-212#
L10060  64-81#
L10061  64-151#
L10062  64-208#
L10063  65-18    65-72    65-132   65-190#
L10064  65-68#
L10065  65-126#
L10066  65-187#
L10067  66-15    66-60#
L10070  68-20    68-67#
L10071  69-26    69-39    69-59    69-80    69-99    69-124   69-149   69-181#
L10072  69-54#
L10073  69-74#
L10074  69-94#
L10075  69-119#
L10076  69-144#
L10077  69-170#
L10100  70-19    70-23    70-65    70-71    70-113   70-119   70-162   70-166#
L10101  70-67#
L10102  70-115#
L10103  70-164#
L10104  72-29    72-49    72-52    72-57    72-80    72-101   72-104   72-109   72-124   72-130   72-140   72-143   72-148#
L10105  72-74#
L10106  72-145#
L10107  73-20    73-47    73-69#
L10110  73-43#
L10111  73-67#
L10112  74-16    74-43#
L10113  75-15    75-38    75-49#
L10114  76-28    76-39    76-56#
L10115  77-18    77-37    77-43#
L10116  78-15    78-44#
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CROSS REFERENCE TABLE (CREF V01-05)

```
L10117  79-15    79-44#
L10120  80-15    80-43#
L10121  81-18    81-38    81-44#
L10122  83-19    83-39    83-46#
L10123  84-25    84-47    84-56    84-80    84-92#
L10124  84-52#
L10125  84-90#
L10126  85-16    85-44#
L10127  86-16    86-44#
L10130  87-16    87-102#
L10131  88-16    88-42#
L10132  89-16    89-42#
L10133  90-16    90-44#
L10134  91-16    91-42#
L10135  93-18    93-43#
L10136  94-16    94-43#
L10137  95-16    95-43#
L10140  96-16    96-46#
L10141  97-16    97-45#
L10142  98-16    98-46#
L10143  99-16    99-43#
L10144  100-18   100-45   100-52   100-57   100-61#
L10145  101-14   101-57#
L10146  102-14   102-57#
L10147  103-13   103-20#
LENGTH  2 -64#   29-32    72-35*   72-87*   73-25*   74-21*   75-21*   76-18*   76-25*   76-32    76-42    76-49*   76-50    77-23*
        76-22*   79-22*   80-22*   81-24*   83-25*   84-32*   84-63*   85-23*   86-23*   87-20*   88-21*   89-21*   90-23*   91-21*
        93-23*   94-22*   95-22*   96-24*   97-23*   98-24*   99-22*
LF      21- 39#  103-24   103-25
LL      21-41#   32-87    37-96    37-98    40-104   68-38    68-49    68-61    69-44    69-64    69-85    69-154   70-123
LOCATE  53-22    53-52#
LOE     21-8#
LOGDEV  22-65#   33-33    40-44*   40-48*   40-49    40-51    41-22    51-11    53-43
LOOP    21-77#   75-18    81-21    83-22    95-19
LOT     21-8#
MAINT   22-66#   30-57    72-46*   72-98*   73-36*   73-60*   74-34*   75-32*   76-36*   77-34*   78-35*   79-35*   80-34*   81-35*
        83-36*   84-43*   84-74*   85-35*   86-35*   88-32*   89-32*   90-34*   91-32*   93-34*   94-33*   95-33*   96-36*   97-35*
        98-36*   99-33*
MASK    29-67    29-80#
MCFLAG  22-67#   30-45*   32-33    32-36    32-37    32-39*   32-64    32-67*   43-34*   43-35    44-31*   44-32    44-38    63-20*
        65-21*   65-76*   65-136*  66-18*   69-41*   69-48    69-61*   69-68    69-82*   69-88    69-101*  69-108   69-114   69-126*
        69-133   69-139   69-151*  69-158   69-165   70-26*   70-45    70-56    70-74*   70-93    70-104   70-122*  70-141   70-153
        100-36*
MM      21-107#  40-98    40-116   54-42    58-22    58-56    59-36    62-24    63-35    64-44    64-97    64-169   65-32    65-88
        65-148   66-32    70-41    70-89    70-137
MMASK   32-49    32-87#
MODE    22-68#   29-36    31-35    44-64    72-30*   72-81*   73-21*   74-17*   75-16*   76-15*   77-19*   78-16*   79-16*   80-16*
        81-19*   83-20*   84-26*   84-57*   85-17*   86-17*   87-17*   88-17*   89-17*   90-17*   91-17*   93-19*   94-17*   95-17*
        96-17*   97-17*   98-17*   99-17*   101-20*  102-19*
MODEM   22-106#  28-40*   28-41*   28-44*   32-43    44-40*   44-41*   44-44*
NESTPC  22-69#
NEWST   40-35    40-43#   40-50
NOERR   21-70#   76-16
NONE1   21-71#   73-48
NONE2   21-72#
NXM     41-10    50-18#
NXMFLG  22-70#   40-17*   41-11*   41-20    42-10    50-20*   53-23*   53-40    53-45*   53-53    53-57*
```

CROSS REFERENCE TABLE (CREF V01-05)

CROSS REFERENCE TABLE (CREF V01-05)

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RSAVE    22-75#  43-57*  64-61*  64-62   65-55   65-112  65-171
RSIZE    22-172# 29-72
RSOM     21-85#
RSTARY   21-49#  43-48   44-49   44-57   64-59   64-70   64-112  64-128  64-133  64-145  64-184  64-202  65-59   65-116
         65-176  87-62   87-71
RTS      21-40#  32-87   37-84   37-86   40-101  68-21   68-49   68-52   69-44   69-64   69-85   69-104  70-27
RXACT    21-50#  62-29   62-34   62-39   62-46   63-52   64-50   64-75   64-103  64-175  65-38   65-94   65-154
RXCSR    22-23#  28-24   28-40   30-59*  30-64*  37-84   37-90   37-96   37-105  43-32   43-37*  43-46*  44-26   44-34*
         44-71*  45-22   45-35*  54-62   56-29*  56-30   56-33*  56-40*  56-41   56-44*  56-45   56-50*  62-23*  62-29
         62-34   62-37   62-39   62-44*  62-46   63-33*  63-47*  63-52   64-46*  64-50   64-59   64-70   64-75   64-99*
         64-103  64-112  64-128  64-133  64-143* 64-145  64-171* 64-175  64-184  64-186  64-202  65-34*  65-38   65-59
         65-90*  65-94   65-116  65-150* 65-154  65-176  66-30*  68-22*  68-24   68-26   68-29*  68-31   68-34*  68-39*
         68-41   68-49*  68-53   68-56   68-58*  68-59   68-61*  68-62   69-44*  69-64*  69-85*  69-104* 69-129* 69-154*
         70-40*  70-88*  70-136* 87-34*  87-62   87-64
RXENA    21-42#  40-94   40-115  62-23   62-44   63-33   63-47   64-46   64-99   64-143  64-171  65-34   65-90   65-150
         66-30   70-40   70-88   70-136
RXINI    22-76#  40-94*  40-101* 40-104* 40-109* 40-111  87-34
RXINIT   22-77#  30-64   40-111* 40-112* 101-40* 101-42* 102-39* 102-41*
RXITEN   21-44#  40-112  40-115  44-71   45-35   63-33   65-34   65-90   65-150  66-30   69-44   69-104  69-129  69-154
         70-40   70-88   70-136
RXMINI   22-78#  30-59   40-115*
S&LSYM   17-15#  20-15#  37-10#  37-20#  37-25#  37-32#  37-39#  37-45#  37-51#  37-57#  37-76#  37-81#  37-123# 37-131#
         37-135# 40-126# 41-27#  42-14#  43-59#  44-74#  45-38#  46-44#  47-66#  48-39#  49-49#  50-22#  51-13#  53-49#
         53-60#  54-52#  54-73#  54-75#  56-52#  56-80#  56-109# 56-136# 56-148# 56-150# 58-48#  58-79#  58-82#  59-28#
         59-55#  59-58#  60-46#  62-54#  63-65#  64-81#  64-151# 64-208# 64-212# 65-68#  65-126# 65-187# 65-190# 66-60#
         68-67#  69-54#  69-74#  69-94#  69-119# 69-144# 69-170# 69-181# 70-67#  70-115# 70-164# 70-166# 72-27   72-27
         72-27#  72-55   72-55   72-55#  72-74#  72-78   72-78   72-78#  72-107  72-107  72-107# 72-128  72-128  72-128#
         72-145# 72-148# 73-43#  73-67#  73-69#  74-43#  75-49#  76-56#  77-43#  78-44#  79-44#  80-43#  81-44#  83-46#
         84-52#  84-90#  84-92#  85-44#  86-44#  87-102# 88-42#  89-42#  90-44#  91-42#  93-43#  94-43#  95-43#  96-46#
         97-45#  98-46#  99-43#  100-61# 101-57# 102-57# 103-20#
SAVE     22-79#
SAVTIM   22-80#  40-124* 72-68   72-120
SECADR   21-75#  29-44   72-32   72-83   90-19
SEVEN    21-97#
SF       21-36#  32-87   37-105  68-33   68-49   68-58
SFR      21-47#
SIX      21-96#
SQ       21-109# 37-107  68-36
SSYNCH   21-76#  80-18   98-20   100-22
STARES   22-44#  33-31   34-35   40-41*  40-46*  54-57
STARST   40-31   40-33   40-40#
START    22-81#  46-24   46-27*  47-28   47-42*  48-19   48-24*  48-27*  49-24   49-27*  63-21*  64-35*  64-88*  64-159*
         65-22*  65-77*  65-137* 66-29*  70-39*  70-87*  70-135* 72-33*  72-58*  72-85*  72-110* 72-131* 73-23*  73-50*
         74-19*  75-19*  76-29*  77-21*  78-20*  79-20*  80-20*  81-22*  83-23*  84-30*  84-61*  85-21*  86-21*  88-19*
         89-19*  90-21*  91-19*  93-21*  94-20*  95-20*  96-22*  97-21*  98-22*  99-20*  100-19* 101-17* 102-16*
SUBRPC   22-82#  27-27*  27-28*  27-52*  28-35*  28-36*  28-38*  30-67*  30-68*  30-103* 30-109* 31-46*  31-47*  31-53*
         31-54*  31-68*  31-69*  31-74*  32-29*  32-30*  37-9    37-14   37-16   37-23   37-61   37-63   37-79   37-126
         37-128  40-12*
SVCGBL   17-15#  17-26#  18-11   18-11   18-11   18-11   18-11   18-11   18-11   18-11   18-11   18-11   18-11   18-11
         18-11   18-11   18-11   18-11   18-11   18-11   18-11   18-11   18-11   18-11   18-11   18-11   18-11   18-11
         18-11   18-11   18-11   18-11   18-11   18-11   18-11   18-11   18-11   18-11   18-11   18-11   19-8    20-8
         20-8    24-13   24-18   37-8    37-13   37-22   37-28   37-35   37-41   37-47   37-53   37-60   37-78   37-83
         37-125  37-133  39-8    40-8    41-8    42-9    43-30   44-24   45-20   46-22   47-26   48-18   49-22   50-18
         51-8    53-52   103-13  103-41  103-41  103-41  103-41#
SVCINS   17-15#  17-23#  18-11   18-11   18-11   18-11   18-11   18-11   18-11   18-11   18-11   18-11   18-11   18-11
         18-11   18-11   18-11   18-11   18-11   18-11   18-11   18-11   18-11   18-11   18-11   18-11   18-11   18-11
         18-11   18-11   18-11   18-11   18-11   18-11   18-11   18-11   18-11   18-11   18-11   18-11   18-11   18-11
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                                                                C  2
CVDPVAO DPV11 FUNC DIAG MACRO V03.01 17-JUN-80 16:09:09 PAGE S-15                                    SEQ  221
CROSS REFERENCE TABLE (CREF V01-05 )
        18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11
        18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11
        18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11
        18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11
        18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11
        18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11
        18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11     18-11
        18-11     18-11     18-11     19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8
        19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8
        19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8
        19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8
        19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8
        19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8
        19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8
        19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19 8      19-8      19-8      19-8
        19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8
        19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      19-8      20-8      20-8      20-8      24-13     24-13
        24-13     24-13     24-13     24-13     24-18     24-18     24-18     24-18     24-18     24-18     27-41     27-41     27-41     27-46
        27-46     27-46     27-46     27-46     27-46     27-46     27-46     27-46     27-46     27-46     27-46     27-49     27-49     27-49
        27-49     27-49     27-49     27-49     27-49     27-49     27-49     27-49     27-49     27-49     27-49     27-49     28-37     28-37
        28-37     28-37     28-37     28-37     28-37     28-37     28-37     28-37     28-37     28-37     28-48     28-48     28-48     28-48
        28-48     28-48     28-48     28-48     28-48     28-48     28-48     28-48     28-48     28-48     28-48     30-54     30-54     30-54
        30-54     30-54     30-54     30-54     30-54     30-54     30-54     30-54     30-54     30-54     30-54     30-54     30-54     30-54
        30-54     30-55     30-55     30-55     30-55     30-55     30-55     30-55     30-55     30-55     30-55     30-55     30-55     30-55
        30-55     30-55     30-55     30-55     30-55     30-56     30-56     30-56     30-56     30-56     30-56     30-81     30-81     30-81
        30-89     30-89     30-89     30-89     30-89     30-89     30-89     30-89     30-89     30-89     30-89     30-89     30-93     30-93
        30-93     30-93     30-93     30-93     30-93     30-93     30-93     30-93     30-93     30-93     30-100    30-100    30-100    30-100
        30-100    30-100    30-100    30-100    30-100    30-100    30-100    30-100    30-112    30-112    30-112    30-112    30-112    30-112
        30-113    30-113    30-113    30-113    30-113    30-113    31-48     31-48     31-48     31-48     31-48     31-48     31-48     31-48
        31-48     31-48     31-48     31-48     31-55     31-55     31-55     31-55     31-55     31-55     31-55     31-55     31-55     31-55
        31-55     31-55     31-72     31-72     31-72     31-72     31-72     31-72     31-72     31-72     31-72     31-72     31-72     31-72
        32-35     32-35     32-35     32-35     32-35     32-35     32-35     32-35     32-35     32-35     32-35     32-35     32-36     32-36
        32-36     32-36     32-36     32-36     32-36     32-36     32-36     32-36     32-36     32-36     32-36     32-36     32-36     32-36
        32-36     32-36     32-40     32-40     32-40     32-40     32-40     32-40     32-40     32-40     32-40     32-40     32-40     32-40
        32-40     32-40     32-40     32-44     32-44     32-44     32-44     32-44     32-44     32-44     32-44     32-44     32-44     32-44
        32-44     32-44     32-44     32-44     32-45     32-45     32-45     32-45     32-45     32-45     32-45     32-45     32-45     32-45
        32-45     32-45     32-45     32-45     32-45     32-46     32-46     32-46     32-46     32-46     32-46     32-46     32-46     32-46
        32-46     32-46     32-46     32-46     32-46     32-46     32-55     32-55     32-55     32-55     32-55     32-55     32-55     32-55
        32-55     32-55     32-55     32-55     32-55     32-55     32-55     32-58     32-58     32-58     32-58     32-58     32-58     32-58
        32-58     32-58     32-58     32-58     32-58     32-58     32-58     32-58     32-70     32-70     32-70     32-70     32-70     32-70
        32-70     32-70     32-70     32-70     32-70     32-70     32-70     32-70     32-70     32-70     32-70     32-70     32-73     32-73
        32-73     32-73     32-73     32-73     32-73     32-73     32-73     32-73     32-73     32-73     32-73     32-73     32-73     33-33
        33-33     33-33     33-33     33-33     33-33     33-33     33-33     33-33     33-33     33-33     33-33     33-33     33-33     33-33
        33-33     33-33     33-33     33-33     33-33     33-33     34-37     34-37     34-37     34-37     34-37     34-37     34-37     34-37
        34-37     34-37     34-37     34-37     34-37     34-37     34-37     34-37     34-37     34-37     35-29     35-29     35-29     35-29
        35-29     35-29     35-29     35-29     35-29     35-29     35-29     35-29     35-29     35-29     35-29     35-29     35-29     35-29
        35-29     35-29     35-29     35-29     35-29     35-29     37-9      37-9      37-9      37-9      37-9      37-9      37-9      37-9
        37-9      37-9      37-9      37-9      37-9      37-9      37-9      37-9      37-9      37-9      37-10     37-10     37-10     37-16
        37-16     37-16     37-16     37-16     37-16     37-16     37-16     37-16     37-16     37-16     37-16     37-16     37-16     37-16
        37-16     37-16     37-16     37-18     37-18     37-18     37-18     37-18     37-18     37-18     37-18     37-18     37-18     37-18
        37-18     37-18     37-18     37-18     37-18     37-18     37-18     37-18     37-18     37-19     37-19     37-19     37-19     37-19
        37-19     37-19     37-19     37-19     37-19     37-19     37-19     37-19     37-19     37-19     37-19     37-19     37-19     37-19
        37-19     37-19     37-19     37-20     37-20     37-20     37-23     37-23     37-23     37-23     37-23     37-23     37-23     37-23
        37-23     37-23     37-23     37-23     37-23     37-23     37-23     37-23     37-23     37-23     37-24     37-24     37-24     37-24
        37-24     37-24     37-24     37-24     37-24     37-24     37-24     37-24     37-24     37-24     37-24     37-24     37-24     37-24
        37-24     37-24     37-24     37-24     37-24     37-24     37-24     37-24     37-24     37-25     37-25     37-25     37-29     37-29
        37-29     37-29     37-29     37-29     37-29     37-29     37-29     37-29     37-29     37-29     37-29     37-29     37-29     37-30
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CROSS REFERENCE TABLE (CREF V01-05)

37-30	37-30	37-30	37-30	37-30	37-30	37-30	37-30	37-30	37-30	37-30	37-30	37-30	37-30
37-30	37-30	37-30	37-30	37-30	37-30	37-30	37-30	37-30	37-31	37-31	37-31	37-31	37-31
37-31	37-31	37-31	37-31	37-31	37-31	37-31	37-31	37-31	37-31	37-31	37-31	37-31	37-31
37-31	37-31	37-32	37-32	37-32	37-36	37-36	37-36	37-36	37-36	37-36	37-36	37-36	37-36
37-36	37-36	37-36	37-36	37-36	37-36	37-37	37-37	37-37	37-37	37-37	37-37	37-37	37-37
37-37	37-37	37-37	37-37	37-37	37-37	37-37	37-37	37-37	37-37	37-37	37-37	37-37	37-37
37-37	37-37	37-38	37-38	37-38	37-38	37-38	37-38	37-38	37-38	37-38	37-38	37-38	37-38
37-38	37-38	37-38	37-38	37-38	37-38	37-38	37-38	37-38	37-39	37-39	37-39	37-42	37-42
37-42	37-42	37-42	37-42	37-42	37-42	37-42	37-42	37-42	37-42	37-42	37-42	37-42	37-43
37-43	37-43	37-43	37-43	37-43	37-43	37-43	37-43	37-43	37-43	37-43	37-43	37-43	37-43
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37-117	37-117	37-117	37-117	37-117	37-117	37-117	37-117	37-117	37-117	37-117	37-117	37-117	37-117
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BPOS REFERENCE TABLE (CREF V01-C5)

37-118	37-118	37-118	37-118	37-118	37-118	37-118	37-118	37-118	37-118	37-118	37-121	37-121	37-121
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37-121	37-123	37-123	37-123	37-128	37-128	37-128	37-128	37-128	37-128	37-128	37-128	37-128	37-128
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37-130	37-131	37-131	37-131	37-134	37-134	37-134	37-134	37-134	37-134	37-134	37-134	37-134	37-134
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56-104	56-104	56-104	56-109	56-1'	56-109	56-111	56-111	56-111	56-132	56-132	56-132	56-132	56-132
56-132	56-132	56-132	56-132	56-' 52	56-132	56-132	56-136	56-136	56-136	56-138	56-138	56-138	56-144
56-144	56-144	56-144	56-144	56-144	56-144	56-144	56-144	56-144	56-144	56-144	56-145	56-145	56-145
56-145	56-145	56-145	56-145	56-145	56-145	56-145	56-145	56-145	56-145	56-145	56-145	56-148	56-148
56-148	56-150	56-150	56-150	58-17	58-17	58-17	58-19	58-19	58-19	58-19	58-19	58-19	58-27
58-27	58-27	58-27	58-2'	58-27	58-32	58-32	58-32	58-32	58-32	58-32	58-32	58-32	58-32
58-32	58-32	58-32	58-39	58-39	58-39	58-39	58-39	58-39	58-43	58-43	58-43	58-43	58-43
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CROSS REFERENCE TABLE (CREF V01-05)

60-44	60-44	60-46	60-46	60-46	62-21	62-21	62-21	62-21	62-21	62-21	62-28	62-28	62-28
62-28	62-28	62-28	62-33	62-33	62-33	62-33	62-33	62-33	62-38	62-38	62-38	62-38	62-38
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64-163	64-163	64-163	64-163	64-163	64-163	64-179	64-179	64-179	64-179	64-179	64-179	64-179	64-179
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65-42	65-42	65-42	65-42	65-42	65-42	65-42	65-42	65-42	65-42	65-42	65-51	65-51	65-51
65-51	65-51	65-51	65-51	65-51	65-51	65-51	65-51	65-51	65-57	65-57	65-57	65-57	65-57
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[CROSS REFERENCE TABLE (CREF V01-05)

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[CROSS REFERENCE TABLE (CREF V01-05)

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	103-41													
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	64-83	64-155	65-16	65-70	65-130	69-37	69-57	69-78	69-97	69-122	69-147	70-21	70-69	70-117
	72-26	72-77	73-18	73-45	84-23	84-54								
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	53-49	53-60	54-52	54-73	54-75	56-52	56-80	56-109	56-136	56-148	56-150	58-48	58-79	58-82
	59-28	59-55	59-58	60-46	62-54	63-65	64-81	64-151	64-208	64-212	65-68	65-126	65-187	65-190
	66-60	68-67	69-54	69-74	69-94	69-119	69-144	69-170	69-181	70-67	70-115	70-164	70-166	72-53
	72-73	72-74	72-105	72-126	72-144	72-145	72-148	73-43	73-67	73-69	74-43	75-49	76-56	77-43
	78-44	79-44	80-43	81-44	83-46	84-52	84-90	84-92	85-44	86-44	87-102	88-42	89-42	90-44
	91-42	93-43	94-43	95-43	96-46	97-45	98-46	99-43	100-61	101-57	102-57	103-20		
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	69-23	70-16	72-24	73-17	74-13	75-12	76-13	77-15	78-12	79-12	80-12	81-15	83-15	84-21
	85-12	86-12	87-12	88-12	89-12	90-12	91-12	93-14	94-12	95-12	96-12	97-12	98-12	99-12
	100-14	101-12	102-12											
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[$$INI	40-8#	40-126												
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	37-53#	37-57	37-60#	37-76	37-78#	37-81	37-83#	37-123	37-125#	37-131	37-133#	37-135		
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	72-126	72-126#	72-128	72-128#	72-144	72-144#								
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	50-18#	50-22	53-52#	53-60										
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	58-17#	58-48	58-51#	58-79	59-14#	59-28	59-31#	59-55	64-31#	64-81	64-83#	64-151	64-155#	64-208
	65-16#	65-68	65-70#	65-126	65-130#	65-187	69-37#	69-54	69-57#	69-74	69-78#	69-94	69-97#	69-119
	69-122#	69-144	69-147#	69-170	70-21#	70-67	70-69#	70-115	70-117#	70-164	72-26#	72-74	72-77#	72-145
	73-18#	73-43	73-45#	73-67	84-23#	84-52	84-54#	84-90						
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CROSS REFERENCE TABLE (CREF V0'-05)

	58-61	58-70	58-77	58-82	59-'2#	59-'6	59-33	59-42	59-46	59-58	60-10#	60-'3	60-46	62-18#
	62-21	62-28	62-33	62-38	62-54	63-'3#	63-'7	63-65	64-29#	64-33	64-85	64-'57	64-212	65-13#
	65-18	65-72	65-132	65-'9C	66-'2#	66-'5	66-60	68-'5#	68-20	68-67	69-23#	69-2?	69-39	69-59
	69-80	69-99	69-124	69-149	69-'81	70-'6#	70-19	70-23	70-65	70-71	70-'13	70-119	70-162	70-166
	72-24#	72-29	72-49	72-52	72-57	72-80	72-101	72-104	72-109	72-124	72-130	72-140	72-143	72-148
	73-17#	73-20	73-47	73-69	74-13#	74-16	74-43	75-'2#	75-15	75-38	75-49	76-13#	76-28	76-39
	76-56	77-15#	77-18	77-3'	77-43	78-12#	78-'5	78-44	79-12#	79-15	79-44	80-12#	80-15	80-43
	81-15#	81-18	81-38	81-44	83-'5#	83-19	83-39	83-46	84-2'#	84-25	84-47	84-56	84-80	84-92
	85-12#	85-16	85-44	86-12#	86-'6	86-44	87-'2#	87-'6	87-'02	88-12#	88-16	88-42	89-12#	89-16
	89-42	90-12#	90-16	90-44	9'-12#	91-'6	91-42	93-14#	93 8	93-43	94-12#	94-16	94-43	95-12#
	95-'6	95-43	96-12#	96-'6	96-46	97-'2#	97-'6	97-45	98-12#	98-16	98-46	99-12#	99-16	99-43
	100-14#	100-18	100-45	'00-52	'00-57	100-6'	101-12#	101-14	1'1-57	'02-12#	'02-14	102-57		
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	18-11#	'8-11#	18-11#	27-49	27-49	27-49#	28-48	28-48	28-48#	32-36	32-36	32-36	32-36#	32-36#
	32-40	32-40	32-40#	32-44	32-44	32-44#	32-45	32-45	32-45#	32-46	32-46	32-46#	32-55	32-55
	32-55#	32-58	32-58	32-58#	32-70	32-70	32-70	32-70#	32-70#	32-73	32-73	32-73#	33-33	33-33
	33-33	33-33	33-33#	33-33#	33-33#	34-37	34-37	34-37	34-37#	34-37#	37-9	37-9	37-9	37-9#
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	37-24	37-24#	37-24#	37-24#	37-29	37-29	37-29#	37-30	37-30	37-30	37-30	37-30#	37-30#	37-30#
	37-31	37-31	37-31	37-31#	37-3'#	37-36	37-36	37-36#	37-37	37-37	37-37	37-37	37-37#	37-37#
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	37-70	37-70	37-70	37-70#	37-70#	37-70#	37-71	37-71	37-71	37-71#	37-71#	37-72	37-72	37-72
	37-72	37-72#	37-72#	37-72#	37-73	37-73	37-73	37-73#	37-73#	37-74	37-74	37-74	37-74	37-74#
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	37-80	37-80	37 80	37-80#	37-8'#	37-80#	37-80#	37-87	37-87	37-87#	37-93	37-93	37-93#	37-99
	37-99	37-99#	37-100	37-100	37-10'#	37-101	37-101	37-101#	37-108	37-108	37-108#	37-109	37-109	37-109#
	37-110	37-110	37-1'0#	37-11'	37-'1'	37-111	37-111	37-111#	37-11'#	37-111#	37-112	37-112	37-112	37-112#
	37-112#	37-116	37-116	37-116#	37-'17	37-117	37-'17	37-117	37-117#	37-117#	37-117#	37-118	37-118	37-118
	37-118#	37-118#	37-121	37-121	37-121	37-121#	37-121#	37-128	37-128	37-128	37-128#	37-128#	37-130	37-130
	37-130	37-130	37-'30#	37-130#	37-130#	37-'34	37-134	37-134	37-134#	37-134#	40-57	40-57	40-57	40-57
	40-57#	40-57#	40-57#	40-86	40-86	40-86	40-86	40-86#	40-86#	40-86#	51-11	51-11	51-11	51-11#
	51-11#	53-42	53-42	53-42#	53-59	53-59	53-59	53-59	53-59#	53-59#	53-59#	56-145	56-145	56-145#
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	70-52#	70-100	70-100	70-100#	70-148	70-148	70-148#	70-150	70-150	70-150#	101-46	101-46	101-46#	102-45
	102-45	102-45#												
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	103-17	103-17#	103-17#	103-17#	103-18	103-'8	103-18	103-18#	103-18#	103-18#				
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	31-55#	31-72	31-72#	32-35	32-'5#	53-56	53-56#	54-50	54-50#	54-71	54- 1#	56-48	56-48#	56-76
	56-76#	56-104	56-104#	56-132	56-132#	56-144	56-144#	58-32	58-32#	58-43	58-43#	58-66	58-66#	58-74
	58-74#	59-26	59-26#	59-53	59-53#	60-33	60-33#	60-40	60-40#	62-41	62-41#	62-48	62-48#	62-51
	62-51#	63-44	63-44#	63-54	63-54#	63-57	63-57#	64-54	64-54#	64-67	64-67#	64-72	64-72#	64-77
	64-77#	64-107	64-107#	64-'17	64-117#	64-124	64-124#	64-130	64-130#	64-138	64-138#	64-148	64-148#	64-179
	64-179#	64-192	64-192#	64-199	64-199#	64-205	64-205#	65-42	65-42#	65-51	65-51#	65-57	65-57#	65-61
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	65-173#	65-179	65-179#	66-43	66-43#	66-49	66-49#	68-45	68-45#	68-65	68-65#	69-50	69-50#	69-70
	69-70#	69-90	69-90#	69-'0	69-'0#	69-116	69-116#	69-135	69-135#	69-141	69-141#	69-160	69-160#	69-167
	69-167#	70-50	70-50#	70-58	70-58#	70-98	70-98#	70-106	70-106#	70-146	70-146#	70-155	70-155#	72-71
	72-71#	72-'23	72-123#	73-4'	73-4'#	73-65	73-65#	75-45	75-45#	76-46	76-46#	81-41	81-41#	83-42
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(CROSS REFERENCE TABLE (CREF V01-05)

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	103-39#													
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	37-47#	37-51	37-53#	37-57	37-60#	37-76	37-78#	37-81	37-83#	37-123	37-125#	37-131	37-133#	37-135
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	73-18#	73-43	73-45#	73-67	84-23#	84-52	84-54#	84-90						
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          81-18   81-18#  81-38   81-38#  81-44   81-44#  83-19   83-19#  83-39   83-39#  83-46   83-46#  84-25   84-25#
          84-47   84-47#  84-52   84-52#  84-56   84-56#  84-80   84-80#  84-90   84-90#  84-92   84-92#  85-16   85-16#
          85-44   85-44#  86-16   86-16#  86-44   86-44#  87-16   87-16#  87-102  87-102# 88-16   88-16#  88-42   88-42#
          89-16   89-16#  89-42   89-42#  90-16   90-16#  90-44   90-44#  91-16   91-16#  91-42   91-42#  93-18   93-18#
          93-43   93-43#  94-16   94-16#  94-43   94-43#  95-16   95-16#  95-43   95-43#  96-16   96-16#  96-46   96-46#
          97-16   97-16#  97-45   97-45#  98-16   98-16#  98-46   98-46#  99-16   99-16#  99-43   99-43#  100-18  100-18#
          100-45  100-45# 100-52  100-52# 100-57  100-57# 100-61  100-61# 101-14  101-14# 101-57  101-57# 102-14  102-14#
          102-57  102-57# 103-15  103-15  103-15  103-15# 103-15# 103-15# 103-16  103-16  103-16  103-16# 103-16# 103-16#
          103-17  103-17  103-17  103-17# 103-17# 103-17# 103-18  103-18  103-18  103-18# 103-18# 103-18# 103-20  103-20#
          103-39  103-39#
TSTEST    17-15#  53-20   53-20   53-20#  54-25   54-25   54-25#  54-26   54-56   56-21   56-21   56-21#  56-25   56-55
          56-82   56-111  56-138  58-15   58-15   58-15#  58-17   58-51   59-12   59-12   59-12#  59-14   59-31   60-10
          60-10   60-10#  62-18   62-18   62-18#  63-13   63-13   63-13#  64-29   64-29   64-29#  64-31   64-83   64-155
          65-13   65-13   65-13#  65-16   65-70   65-130  66-12   66-12   66-12#  68-15   68-15   68-15#  69-23   69-23
          69-23#  69-37   69-57   69-78   69-97   69-122  69-147  70-16   70-16   70-16#  70-21   70-69   70-117  72-24
          72-24   72-24#  72-26   72-77   73-17   73-17   73-17#  73-18   73-45   74-13   74-13   74-13#  75-12   75-12
          75-12#  76-13   76-13   76-13#  77-15   77-15   77-15#  78-12   78-12   78-12#  79-12   79-12   79-12#  80-12
          80-12   80-12#  81-15   81-15   81-15#  83-15   83-15   83-15#  84-21   84-21   84-21#  84-23   84-54   85-12
          85-12   85-12#  86-12   86-12   86-12#  87-12   87-12   87-12#  88-12   88-12   88-12#  89-12   89-12   89-12#
          90-12   90-12   90-12#  91-12   91-12   91-12#  93-14   93-14   93-14#  94-12   94-12   94-12#  95-12   95-12
          95-12#  96-12   96-12   96-12#  97-12   97-12   97-12#  98-12   98-12   98-12#  99-12   99-12   99-12#  100-14
          100-14  100-14#  101-12  101-12  101-12#  102-12  102-12  102-12#  103-41
TSTSTM    17-15#  27-41   27-46   27-49   28-37   28-48   30-54   30-55   30-56   30-81   30-89   30-93   30-100  30-112
          30-113  31-48   31-55   31-72   32-35   32-36   32-40   32-44   32-45   32-46   32-55   32-58   32-70   32-73
          33-33   34-37   37-9    37-10   37-16   37-18   37-19   37-20   37-23   37-24   37-25   37-29   37-30   37-31
          37-32   37-36   37-37   37-38   37-39   37-42   37-43   37-44   37-45   37-48   37-49   37-50   37-51   37-54
          37-55   37-56   37-57   37-63   37-65   37-66   37-67   37-68   37-69   37-70   37-71   37-72   37-73   37-74
          37-75   37-76   37-79   37-80   37-81   37-87   37-93   37-99   37-100  37-101  37-108  37-109  37-110  37-111
          37-112  37-116  37-117  37-118  37-121  37-123  37-128  37-130  37-131  37-134  37-135  40-10   40-28   40-30
          40-32   40-34   40-36   40-51   40-57   40-86   40-126  41-10   41-22   41-23   41-24   41-27   42-14   51-10
          51-11   51-13   53-22   53-42   53-43   53-44   53-47   53-49   53-56   53-59   54-26   54-28   54-50   54-52
          54-56   54-59   54-71   54-73   54-75   56-23   56-25   56-48   56-52   56-55   56-76   56-80   56-82   56-104
          56-109  56-111  56-132  56-136  56-138  56-144  56-145  56-148  56-150  58-17   58-19   58-27   58-32   58-39
          58-43   58-46   58-48   58-51   58-53   58-61   58-66   58-70   58-74   58-77   58-79   58-82   59-14   59-16
          59-26   59-28   59-31   59-33   59-42   59-46   59-53   59-55   59-58   60-13   60-17   60-18   60-33   60-40
          60-42   60-44   60-46   62-21   62-28   62-33   62-38   62-41   62-48   62-51   62-54   63-17   63-23   63-24
          63-25   63-44   63-54   63-57   63-60   63-62   63-63   63-65   64-31   64-33   64-37   64-38   64-54   64-67
          64-72   64-77   64-81   64-83   64-85   64-90   64-91   64-107  64-117  64-124  64-130  64-138  64-148  64-151
          64-155  64-157  64-162  64-163  64-179  64-192  64-199  64-205  64-208  64-212  65-16   65-18   65-24   65-25
          65-26   65-42   65-51   65-57   65-61   65-63   65-65   65-66   65-68   65-70   65-72   65-80   65-81   65-82
          65-98   65-107  65-114  65-118  65-120  65-122  65-123  65-126  65-130  65-132  65-140  65-141  65-142  65-158
          65-167  65-173  65-179  65-181  65-183  65-187  65-190  66-15   66-19   66-20   66-21   66-43   66-49   66-53
          66-55   66-56   66-60   68-20   68-45   68-65   68-67   69-26   69-29   69-30   69-37   69-39   69-50   69-54
          69-57   69-59   69-70   69-74   69-78   69-80   69-90   69-94   69-97   69-99   69-110  69-111  69-116  69-119
          69-124  69-124  69-135  69-136  69-141  69-144  69-147  69-149  69-160  69-161  69-162  69-167  69-170  69-175
          69-177  69-178  69-181  70-19   70-21   70-23   70-29   70-30   70-31   70-50   70-52   70-58   70-61   70-63
          70-64   70-65   70-67   70-69   70-71   70-77   70-78   70-79   70-98   70-100  70-106  70-109  70-111  70-112
          70-113  70-115  70-117  70-119  70-125  70-126  70-127  70-146  70-148  70-150  70-155  70-158  70-160  70-161
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CROSS REFERENCE TABLE (CREF V01-05)

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          70-162   70-164   70-166   72-26    72-27    72-29    72-49    72-52    72-53    72-55    72-57    72-71    72-73    72-74
          72-77    72-78    72-80    72-101   72-104   72-105   72-107   72-109   72-123   72-124   72-126   72-128   72-130   72-140
          72-143   72-144   72-145   72-148   73-18    73-20    73-41    73-43    73-45    73-47    73-65    73-67    73-69    74-16
          74-43    75-15    75-38    75-45    75-49    76-28    76-39    76-46    76-56    77-18    77-37    77-43    78-15    78-44
          79-15    79-44    80-15    80-43    81-18    81-38    81-41    81-44    83-19    83-39    83-42    83-46    84-23    84-25
          84-47    84-50    84-52    84-54    84-56    84-80    84-88    84-90    84-92    85-16    85-40    85-44    86-16    86-40
          86-44    87-16    87-43    87-58    87-79    87-102   88-16    88-42    89-16    89-42    90-16    90-44    91-16    91-42
          93-18    93-43    94-16    94-43    95-16    95-43    96-16    96-46    97-16    97-45    98-16    98-46    99-16    99-43
          100-18   100-38   100-39   100-40   100-45   100-52   100-57   100-61   101-14   101-36   101-37   101-38   101-46   101-57
          102-14   102-35   102-36   102-37   102-45   102-57
T$TSTS    17-15#   53-20#   54-25#   56-21#   58-15#   59-12#   60-10#   62-18#   63-13#   64-29#   65-13#   56-12#   68-15#   69-23#
          70-16#   72-24#   73-17#   74-13#   75-12#   76-13#   77-15#   78-12#   79-12#   80-12#   81-15#   83-15#   84-21#   85-12#
          86-12#   87-12#   88-12#   89-12#   90-12#   91-12#   93-14#   94-12#   95-12#   96-12#   97-12#   98-12#   99-12#   100-14#
          101-12#  102-12#
T1        19-8     53-20#
T10       19-8     65-13#
T10.1     65-16#
T10.2     65-70#
T10.3     65-130#
T11       19-8     66-12#
T12       19-8     68-15#
T13       19-8     69-23#
T13.1     69-37#
T13.2     69-57#
T13.3     69-78#
T13.4     69-97#
T13.5     69-122#
T13.6     69-147#
T14       19-8     70-16#
T14.1     70-21#
T14.2     70-69#
T14.3     70-117#
T15       19-8     72-24#
T15.1     72-26#
T15.2     72-77#
T16       19-8     73-17#
T16.1     73-18#
T16.2     73-45#
T17       19-8     74-13#
T18       19-8     75-12#
T19       19-8     76-13#
T2        19-8     54-25#
T2.1      54-26#
T2.2      54-56#
T20       19-8     77-15#
T21       19-8     78-12#
T22       19-8     79-12#
T23       19-8     80-12#
T24       19-8     81-15#
T25       19-8     83-15#
T26       19-8     84-21#
T26.1     84-23#
T26.2     84-54#
T27       19-8     85-12#
T28       19-8     86-12#
T29       19-8     87-12#
T3        19-8     56-21#
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CROSS REFERENCE TABLE (CREF V01-05)

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T3.1    56-25#
T3.2    56-55#
T3.3    56-82#
T3.4    56-111#
T3.5    56-138#
T30     19-8     88-12#
T31     19-8     89-12#
T32     19-8     90-12#
T33     19-8     91-12#
T34     19-8     93-14#
T35     19-8     94-12#
T36     19-8     95-12#
T37     19-8     96-12#
T38     19-8     97-12#
T39     19-8     98-12#
T4      19-8     58-15#
T4.1    58-17#
T4.2    58-51#
T40     19-8     99-12#
T41     19-8    100-14#
T42     19-8    101-12#
T43     19-8    102-12#
T5      19-8     59-12#
T5.1    59-14#
T5.2    59-31#
T6      19-8     60-10#
T7      19-8     62-18#
T8      19-8     63-13#
T9      19-8     64-29#
T9.1    64-31#
T9.2    64-83#
T9.3    64-155#
TBE     21-106#  27-47   37-69   58-26   58-38   58-42   58-60   58-73   59-22   59-25   59-41   59-45   62-27   62-32
        87-48
TDSR    22-28#   28-32   30-73   46-26*  46-35*  46-38*  46-41*  47-40*  47-51*  47-58*  47-62*  48-22*  48-28*  48-30*
        48-34*   49-26*  49-33*  49-34*  49-38*  54-30*  54-68   56-85*  56-86   56-89*  56-90   56-95*  56-96   56-98*
        56-106*  56-139* 58-25*  58-36*  58-59*  59-17*  59-24   59-40*  59-44*  59-49   62-26*  62-31*  62-36*  87-37*
        87-41    87-84   87-87*  87-89*  87-93*
TEMP    22-83#
TEND    22-84#   47-62   72-37*  72-89*  73-27*  74-23*  75-23*  76-21*  77-25*  78-24*  79-24*  80-24*  81-26*  83-27*
        84-34*   84-65*  85-25*  86-25*  88-23*  89-23*  90-25*  91-23*  93-25*  94-24*  95-24*  96-26*  97-25*  98-26*
        99-24*
TEOM    21-123#  46-38   46-34   49-33   49-38   72-37   72-89   74-23   75-23   76-21   77-25   78-24   79-24   80-24
        84-34    84-65   85-25   86-25   87-93   88-23   89-23   90-25   91-23   93-25   94-24   95-24   96-26   97-25
        98-26    99-24
TERR    21-127#
TFLAG   22-85#   30-44*  40-16*  46-23*  60-14*  60-29   60-35*  63-18*  64-34*  64-87*  64-158* 65-20*  65-75*  65-135*
        66-16*   66-41   70-24*  70-72*  70-120*
TGA     21-125#  75-23   95-24
THREE   21-93#
TIMEO   22-86#   30-47*  30-85*  72-69   72-121
TIMER   22-87#   30-69   40-119* 40-122* 40-124  72-64*  72-68*  72-116* 72-120* 87-32
TM      21-110#  28-42   28-44   32-87   44-42   44-44
TOGGLE  22-88#   40-19*  43-42   43-44   43-45*  70-27*  70-75*  70-123*
TSOM    21-122#  46-26   47-51   48-22   48-28   49-26   49-33   58-25   58-59   59-40   62-26   62-31   72-36   72-88
        73-26    74-22   75-22   76-20   78-23   79-23   80-23   81-25   83-26   84-33   84-64   85-24   86-24   87-37
        87-84    87-87   88-22   89-22   90-24   91-22   94-23   95-23   96-25   97-24   98-25   99-23
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CROSS REFERENCE TABLE (CREF V01-05)

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TSTART  22-89#  47-30   47-36   47-37*  47-40   72-36*  72-88*  73-26*  74-22*  75-22*  76-20*  77-24*  78-23*  79-23*
        80-23*  81-25*  83-26*  84-33*  84-64*  85-24*  86-24*  88-22*  89-22*  90-24*  91-22*  93-24*  94-23*  95-23*
        96-25*  97-24*  98-25*  99-23*
TURN    22-33#  30-79   33-29   34-33   40-92*  40-96   40-102  40-107  58-20   58-54   59-34
TWO     21-92#
TXABO   21-124# 46-35   73-27   81-26   83-27
TXACT   21-105# 58-28   58-40   58-62   58-71
TXCSR   22-27#  28-23*  28-28   28-42   30-60*  30-65*  30-92*  30-111* 42-12*  44-42   47-63*  48-35*  49-45*  54-31
        54-34*  54-35   54-38*  54-39   54-42*  54-43   54-46*  54-47   54-66   58-22*  58-24*  58-26   58-28   58-30
        58-37*  58-38   58-40   58-56*  58-58*  58-60   58-62   58-64   58-71   59-22   59-36*  59-39*  59-41   59-45
        60-25*  60-36*  62-24*  62-27   62-32   63-35*  64-44*  64-97*  64-169* 65-32*  65-88*  65-148* 66-32*  68-36
        70-41*  70-89*  70-137* 87-35*  87-48
TXENA   21-108# 30-92   40-95   40-116  54-42   58-24   58-31   58-37   58-58   58-65   59-39   60-25   62-24   63-35
        64-44   64-97   64-169  65-32   65-88   65-148  66-32   70-41   70-89   70-137
TXIE    21-112# 40-114  40-116  47-63   48-35   49-45   60-25   63-35   64-44   64-97   64-169  65-32   65-88   65-148
        66-32   70-41   70-89   70-137
TXINI   22-90#  40-95*  40-98*  40-113  87-35
TXINIT  22-91#  30-65   40-113* 40-114*
TXMINI  22-92#  30-60   40-116*
UAM     21-8#
VRCE    21-69#  78-17   86-18   97-18
VRCO    21-68#  79-17   80-17   85-18   96-19
XSALWA  17-15#
XSFALS  17-15#
XSOFFS  17-15#
XSTRUE  17-15#
XCOUNT  22-113# 29-35   29-54*  29-60*  29-62*  29-64   30-51   31-51   31-60   72-39*  72-91*  73-29*  73-53*  74-25*
        75-25*  76-23*  77-27*  78-26*  79-26*  80-26*  81-28*  83-29*  84-36*  84-67*  84-82   85-27*  86-27*  87-22*
        87-30   88-25*  89-25*  90-27*  91-25*  93-27*  94-26*  95-26*  96-28*  97-27*  98-28*  99-26*  101-18* 102-17*
XDATA   30-54   47-26#
XDATA2  48-18#  101-36  102-35
XDDCMP  49-22#  100-38
XINT    46-23#  60-17   63-23   64-37   64-90   64-162  65-24   65-80   65-140  66-20   70-30   70-78   70-126
XMITD   22-115# 37-130  47-44*  47-59*  48-31*  49-29*  49-35*  87-86*  87-90*  101-23* 102-22*
XMITBUF 22-166# 29-34   30-50   31-58   72-66*  72-118* 72-137* 87-29
XMITVEC 22-13#  30-54   30-112  40-89*  40-90*  60-17   60-44   63-23   63-63   64-37   64-90   64-162  65-24   65-66
        65-80   65-123  65-140  66-20   66-56   69-178  70-30   70-64   70-78   70-112  70-126  70-161  100-38  101-36
        102-35
XTYPE   22-112# 29-33   72-38*  72-90*  73-28*  73-52*  74-24*  75-24*  76-22*  77-26*  78-25*  79-25*  80-25*  81-27*
        83-28*  84-35*  84-66*  85-26*  86-26*  87-21*  88-24*  89-24*  90-26*  91-24*  92-26*  94-25*  95-25*  96-27*
        97-26*  98-27*  99-25*
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CROSS REFERENCE TABLE (CREF V01-05)

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$DELAY   25-91#   54-60    60-37    62-45    63-49    64-188   68-23    68-30    68-35    68-40    68-50    69-47    69-67    69-87
         69-107   69-132   69-157
BCOMPL    1-15#   17-15#   40-31    40-33    40-35
BERROR    1-19#   17-15#
BGNAU     1-23#   17-15#
BGNAUT    1-31#   17-15#   41-8
BGNCLN    1-39#   17-15#   42-9
BGNDU     1-47#   17-15#   51-8
BGNHRD    1-55#   17-15#   103-13
BGNHU     1-66#   17-15#   20-8
BGNINI    1-77#   17-15#   40-8
BGNMOD    1-85#   17-15#   17-18
BGNMSG    1-98#   17-15#   37-8     37-13    37-22    37-28    37-35    37-41    37-47    37-53    37-60    37-78    37-83    37-125
         37-133
BGNPRO    1-106#  17-15#   39-8
BGNPTA    1-114#  17-15#
BGNRPT    1-144#  17-15#
BGNSEG    1-152#  17-15#   72-27    72-55    72-78    72-107   72-128
BGNSET    1-161#  17-15#
BGNSFT    1-182#  17-15#
BGNSRV    1-193#  17-15#   43-30    44-24    45-20    46-22    47-26    48-18    49-22    50-18    53-52
BGNSUB    1-201#  17-15#   54-26    54-56    56-25    56-55    56-82    56-111   56-138   58-17    58-51    59-14    59-31    64-31
         64-83    64-155   65-16    65-70    65-130   69-37    69-57    69-78    69-97    69-122   69-147   70-21    70-69    70-117
         72-26    72-77    73-18    73-45    84-23    84-54
BGNSW     1-225#  17-15#
BGNTST    1-236#  17-15#   53-20    54-25    56-21    58-15    59-12    60-10    62-18    63-13    64-29    65-13    66-12    68-15
         69-23    70-16    72-24    73-17    74-13    75-12    76-13    77-15    78-12    79-12    80-12    81-15    83-15    84-21
         85-12    86-12    87-12    88-12    89-12    90-12    91-12    93-14    94-12    95-12    96-12    97-12    98-12    99-12
        100-14   101-12   102-12
BNCOMP    1-266#  17-15#   40-37    40-52
BNERRO    1-270#  17-15#
BREAK     1-274#  17-15#   27-41    30-81
BRESET    1-278#  17-15#   51-10    54-59
CALL     25-17#   54-27    56-22    58-18    58-52    58-69    59-15    59-32    60-12    62-20    63-16    63-59    64-32    64-84
         64-156   65-17    65-71    65-131   66-14    66-52    68-16    68-19    69-24    69-38    69-58    69-79    69-98    69-123
         69-148   69-174   70-17    70-22    70-60    70-70    70-108   70-118   70-157   72-28    72-45    72-48    72-51    72-56
         72-67    72-79    72-97    72-100   72-103   72-108   72-119   72-129   72-139   72-142   73-19    73-35    73-38    73-46
         73-59    73-62    74-15    74-33    74-36    74-39    75-14    75-31    75-34    75-37    76-24    76-27    76-38    77-17
         77-33    77-36    77-39    78-14    78-34    78-37    78-40    79-14    79-34    79-37    79-40    80-14    80-33    80-36
         80-39    81-17    81-34    31-37    83-18    83-35    83-38    84-24    84-42    84-46    84-55    84-72    84-79    85-15
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         88-39    89-13    89-15    89-31    89-34    89-37    89-39    90-13    90-15    90-33    90-36    90-39    90-43    91-13
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         94-35    94-38    94-40    95-13    95-15    95-32    95-35    95-38    95-40    96-13    96-15    96-35    96-38    96-41
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        102-40   102-54
CKLOOP    1-282#  17-15#
CLOCK     1-286#  17-15#
CLOSE     1-292#  17-15#
CLRVEC    1-296#  17-15#   30-112   30-113   40-28    41-24    53-47    60-44    63-62    63-63    65-65    65-66    65-122   65-123
         65-183   66-55    66-56    69-177   69-178   70-63    70-64    70-111   70-112   70-160   70-161
COMMEN    1-301#  17-15#
DELAY     1-322#  17-15#   35-29    59-18
DESCRI    1-317#  17-15#   24-18
DEVTYP    1-341#  17-15#   24-13
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DODU     1-380#  17-15#  41-22   53-43
DORPT    1-385#  17-15#
ENDAU    1-389#  17-15#
ENDAUT   1-401#  17-15#  41-27
ENDCLN   1-413#  17-15#  42-14
ENDCOM   1-425#  17-15#
ENDDU    1-441#  17-15#  51-13
ENDHRD   1-453#  17-15#  103-20
ENDHW    1-465#  17-15#  20-15
ENDINI   1-475#  17-15#  40-126
ENDMOD   1-487#  17-15#  103-39
ENDMSG   1-500#  17-15#  37-10   37-20   37-25   37-32   37-39   37-45   37-51   37-57   37-76   37-81   37-123  37-131
         37-135
ENDPRO   1-512#  17-15#  39-14
ENDPTA   1-520#  17-15#
ENDRPT   1-529#  17-15#
ENDSEG   1-541#  17-15#  72-53   72-73   72-105  72-126  72-144
ENDSET   1-555#  17-15#
ENDSFT   1-568#  17-15#
ENDSRV   1-580#  17-15#  43-59   44-74   45-38   46-44   47-66   48-39   49-49   50-22   53-60
ENDSUB   1-596#  17-15#  54-52   54-73   56-52   56-80   56-109  56-136  56-148  58-48   58-79   59-28   59-55   64-81
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         72-74   72-145  73-43   73-67   84-52   84-90
ENDSW    1-614#  17-15#
ENDTST   1-624#  17-15#  53-49   54-75   56-150  58-82   59-58   60-46   62-54   63-65   64-212  65-190  66-60   68-67
         69-181  70-166  72-148  73-69   74-43   75-49   76-56   77-43   78-44   79-44   80-43   81-44   83-46   84-92
         85-44   86-44   87-102  88-42   89-42   90-44   91-42   93-43   94-43   95-43   96-46   97-45   98-46   99-43
         100-61  101-57  102-57
EQUALS   1-642#  17-15#  21-8
ERRDF    1-714#  17-15#  27-46   28-37   30-89   30-93   30-100  31-48   31-55   31-72   32-35   53-56   54-50   54-71
         56-48   56-76   56-104  56-132  56-144  58-32   58-43   58-66   58-74   59-26   59-53   60-33   60-40   62-41
         62-48   62-51   63-44   63-54   63-57   64-54   64-67   64-72   64-77   6 -107  64-117  64-124  64-130  64-138
         64-148  64-179  64-192  64-199  64-205  65-42   65-51   65-57   65-61   65-98   65-107  65-114  65-118  65-158
         65-167  65-173  65-179  66-43   66-49   68-45   68-65   69-50   69-70   69-90   69-110  69-116  69-135  69-141
         69-160  69-167  70-50   70-58   70-98   70-106  70-146  70-155  72-71   72-123  73-41   73-65   75-45   76-46
         81-41   83-42   84-50   84-88   85-40   86-40   87-43   87-58   87-79
ERRHRD   1-718#  17-15#
ERROR    1-722#  17-15#
ERRSF    1-726#  17-15#
ERRSOF   1-730#  17-15#
ERRTBL   1-734#  17-15#
ESCAPE   1-744#  17-15#  54-28   56-23   58-19   58-27   58-39   58-46   58-53   58-61   58-70   58-77   59-16   59-33
         59-42   59-46   60-13   62-21   62-28   62-33   62-38   63-17   64-33   64-85   64-157  65-18   65-72   65-132
         66-15   68-20   69-39   69-59   69-80   69-99   69-124  69-149  70-23   70-65   70-71   70-113  70-119  70-162
         72-29   72-49   72-52   72-57   72-80   72-101  72-104  72-109  72-124  72-130  72-140  72-143  73-20   73-47
         74-16   75-15   75-38   76-28   76-39   77-18   77-37   78-15   79-15   80-15   81-18   81-38   83-19   83-39
         84-25   84-47   84-56   84-80   85-16   86-16   87-16   88-16   89-16   90-16   91-16   93-18   94-16   95-16
         96-16   97-16   98-16   99-16   100-18  100-45  100-52  100-57  101-14  102-14
EXIT     1-771#  17-15#  69-26   70-19
FEQUAL   1-810#  17-15#
GETBYT   1-824#  17-15#
GETPRI   1-834#  17-15#
GETWOR   1-829#  17-15#
GMANIA   1-839#  17-15#
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GPIHARD   1-868#  17-15#  40-5
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GPIRMD    1-903#  17-15#  103-17
GPIRML    1-934#  17-15#  103-18
HEADER    1-954#  17-15#  18-11
INLOOP    1-962#  17-15#
IOSETU    1-966#  17-15#
IOSTAR    1-974#  17-15#
KT11      1-982#  17-15#
LASTAD    1-;47#  17-15#  103-41
MSBYTE    1-D00#  17-15#  18-11   18-11   18-11   18-11#
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MSCNTO    1-E82#  17-15#  103-15  103-15#  103-16  103-16#  103-17  103-17#  103-18  103-18#
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          37-24   37-24#  37-29   37-29#  37-30   37-30   37-30#  37-31   37-31#  37-36   37-36#  37-37   37-37   37-37#
          37-38   37-38#  37-42   37-42#  37-43   37-43   37-43#  37-44   37-44#  37-48   37-48#  37-49   37-49   37-49#
          37-50   37-50#  37-54   37-54#  37-55   37-55   37-55#  37-56   37-56#  37-63   37-63#  37-65   37-65#  37-66
          37-66   37-66#  37-67   37-67#  37-68   37-68   37-68#  37-69   37-69#  37-70   37-70   37-70#  37-71   37-71#
          37-72   37-72   37-72#  37-73   37-73#  37-74   37-74   37-74#  37-75   37-75#  37-79   37-79#  37-80   37-80
          37-80   37-80#  37-87   37-87#  37-93   37-93#  37-99   37-99#  37-100  37-100#  37-101  37-101#  37-108  37-108#
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          37-118  37-118#  37-121  37-121#  37-128  37-128#  37-130  37-130  37-130#  37-134  37-134#  40-57  40-57  40-57#
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          24-13#  24-18   24-18#
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          94-43   94-43#  95-43   95-43#  96-46   96-46#  97-45   97-45#  98-46   98-46#  99-43   99-43#  100-61  100-61#
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          37-131#  37-135#  40-126#  41-27#  42-14#  43-59#  44-74#  45-38#  46-44#  47-66#  48-39#  49-49#  50-22#  51-13#
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MSERRI	1-249#	17-15#	27-46	27-46#	28-37	28-37#	30-89	30-89#	30-93	30-93#	30-100	30-100#	31-48	31-48#
	31-55	31-55#	31-72	31-72#	32-35	32-35#	53-56	53-56#	54-50	54-50#	54-71	54-71#	56-48	56-48#
	56-76	56-76#	56-104	56-104#	56-132	56-132#	56-144	56-144#	58-32	58-32#	58-43	58-43#	58-66	58-66#
	58-74	58-74#	59-26	59-26#	59-53	59-53#	60-33	60-33#	60-40	60-40#	62-41	62-41#	62-48	62-48#
	62-51	62-51#	63-44	63-44#	63-54	63-54#	63-57	63-57#	64-54	64-54#	64-67	64-67#	64-72	64-72#
	64-77	64-77#	64-107	64-107#	64-117	64-117#	64-124	64-124#	64-130	64-130#	64-138	64-138#	64-148	64-148#
	64-179	64-179#	64-192	64-192#	64-199	64-199#	64-205	64-205#	65-42	65-42#	65-51	65-51#	65-57	65-57#
	65-61	65-61#	65-98	65-98#	65-107	65-107#	65-114	65-114#	65-118	65-118#	65-158	65-158#	65-167	65-167#
	65-173	65-173#	65-179	65-179#	66-43	66-43#	66-49	66-49#	68-45	68-45#	68-65	68-65#	69-50	69-50#
	69-70	69-70#	69-90	69-90#	69-110	69-110#	69-116	69-116#	69-135	69-135#	69-141	69-141#	69-160	69-160#
	69-167	69-167#	70-50	70-50#	70-58	70-58#	70-98	70-98#	70-106	70-106#	70-146	70-146#	70-155	70-155#
	72-71	72-71#	72-123	72-123#	73-41	73-41#	73-65	73-65#	75-45	75-45#	76-46	76-46#	81-41	81-41#
	83-42	83-42#	84-50	84-50#	84-88	84-88#	85-40	85-40#	86-40	86-40#	87-43	87-43#	87-58	87-58#
	87-79	87-79#												
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	59-46	59-46#	60-13	60-13#	62-21	62-21#	62-28	62-28#	62-33	62-33#	62-38	62-38#	63-17	63-17#
	64-33	64-33#	64-85	64-85#	64-157	64-157#	65-18	65-18#	65-72	65-72#	65-132	65-132#	66-15	66-15#
	68-20	68-20#	69-39	69-39#	69-59	69-59#	69-80	69-80#	69-99	69-99#	69-124	69-124#	69-149	69-149#
	70-23	70-23#	70-65	70-65#	70-71	70-71#	70-113	70-113#	70-119	70-119#	70-162	70-162#	72-29	72-29#
	72-49	72-49#	72-52	72-52#	72-57	72-57#	72-80	72-80#	72-101	72-101#	72-104	72-104#	72-109	72-109#
	72-124	72-124#	72-130	72-130#	72-140	72-140#	72-143	72-143#	73-20	73-20#	73-47	73-47#	74-16	74-16#
	75-15	75-15#	75-38	75-38#	76-28	76-28#	76-39	76-39#	77-18	77-18#	77-37	77-37#	78-15	78-15#
	79-15	79-15#	80-15	80-15#	81-18	81-18#	81-38	81-38#	83-19	83-19#	83-39	83-39#	84-25	84-25#
	84-47	84-47#	84-56	84-56#	84-80	84-80#	85-16	85-16#	86-16	86-16#	87-16	87-16#	88-16	88-16#
	89-16	89-16#	90-16	90-16#	91-16	91-16#	93-18	93-18#	94-16	94-16#	95-16	95-16#	96-16	96-16#
	97-16	97-16#	98-16	98-16#	99-16	99-16#	100-18	100-18#	100-45	100-45#	100-52	100-52#	100-57	100-57#
	101-14	101-14#	102-14	102-14#										
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	59-42#	59-46#	60-13#	62-21#	62-28#	62-33#	62-38#	63-17#	64-33#	64-85#	64-157#	65-18#	65-72#	65-132#
	66-15#	68-20#	69-39#	69-59#	69-80#	69-99#	69-124#	69-149#	70-23#	70-65#	70-71#	70-113#	70-119#	70-162#
	72-29#	72-49#	72-52#	72-57#	72-80#	72-101#	72-104#	72-109#	72-124#	72-130#	72-140#	72-143#	73-20#	73-47#
	74-16#	75-15#	75-38#	76-28#	76-39#	77-18#	77-37#	78-15#	79-15#	80-15#	81-18#	81-38#	83-19#	83-39#
	84-25#	84-47#	84-56#	84-80#	85-16#	86-16#	87-16#	88-16#	89-16#	90-16#	91-16#	93-18#	94-16#	95-16#
	96-16#	97-16#	98-16#	99-16#	100-18#	100-45#	100-52#	101-57#	101-14#	102-14#				
MSEXCP	1-E01#	17-15#	103-15	103-15	103-15#	103-16	103-16	103-16#	103-17	103-17	103-17#			
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MSEXSE	1-D22#	17-15#	69-26#	70-19#										
MSEXTJ	1-D18#	17-15#	69-26#	70-19#										
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	37-45	37-45#	37-47	37-47#	37-51	37-51#	37-53	37-53#	37-57	37-57#	37-60	37-60#	37-76	37-76#
	37-78	37-78#	37-81	37-81#	37-83	37-83#	37-123	37-123#	37-125	37-125#	37-131	37-131#	37-133	37-133#
	37-135	37-135#	39-8	39-8#	40-8	40-8#	40-126	40-126#	41-8	41-8#	41-27	41-27#	42-9	42-9#
	42-14	42-14#	43-30	43-30#	43-59	43-59#	44-24	44-24#	44-74	44-74#	45-20	45-20#	45-38	45-38#
	46-22	46-22#	46-44	46-44#	47-26	47-26#	47-66	47-66#	48-18	48-18#	48-39	48-39#	49-22	49-22#
	49-49	49-49#	50-18	50-18#	50-22	50-22#	51-8	51-8#	51-13	51-13#	53-20	53-20#	53-49	53-49#
	53-52	53-52#	53-60	53-60#	54-25	54-25#	54-26	54-26#	54-52	54-52#	54-56	54-56#	54-73	54-73#
	54-75	54-75#	56-21	56-21#	56-25	56-25#	56-52	56-52#	56-55	56-55#	56-80	56-80#	56-82	56-82#

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                70-117   70-117#  70-164   70-164#  70-166   70-166#  72-24    72-24#   72-26    72-26#   72-53    72-53#   72-73    72-73#
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37-74#	37-74#	37-74#	37-74#	37-74#	37-74#	37-75	37-75	37-75	37-75	37-75	37-75	37-75#	37-75#
37-75#	37-75#	37-75#	37-76	37-76#	37-79	37-79	37-79	37-79	37-79	37-79	37-79#	37-79#	37-79#
37-79#	37-79#	37-80	37-80	37-80	37-80	37-80	37-80	37-80	37-80	37-80#	37-80#	37-80#	37-80#
37-80#	37-80#	37-80#	37-81	37-81#	37-87	37-87	37-87	37-87	37-87	37-87#	37-87#	37-87#	37-87#
37-93	37-93	37-93	37-93	37-93	37-93#	37-93#	37-93#	37-93#	37-99	37-99	37-99	37-99	37-99
37-99#	37-99#	37-99#	37-99#	37-100	37-100	37-100	37-100	37-100	37-100#	37-100#	37-100#	37-100#	37-101
37-101	37-101	37-101	37-101	37-101#	37-101#	37-101#	37-101#	37-108	37-108	37-108	37-108	37-108	37-108#
37-108#	37-108#	37-108#	37-109	37-109	37-109	37-109	37-109	37-109#	37-109#	37-109#	37-109#	37-110	37-110
37-110	37-110	37-110	37-110#	37-110#	37-110#	37-110#	37-111	37-111	37-111	37-111	37-111	37-111	37-111
37-111	37-111#	37-111#	37-111#	37-111#	37-111#	37-111#	37-112	37-112	37-112	37-112	37-112	37-112	37-112
37-112#	37-112#	37-112#	37-112#	37-112#	37-116	37-116	37-116	37-116	37-116	37-116#	37-116#	37-116#	37-116#
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37-118	37-118	37-118	37-118	37-118	37-118#	37-118#	37-118#	37-118#	37-118#	37-121	37-121	37-121	37-121
37-121	37-121	37-121#	37-121#	37-121#	37-121#	37-121#	37-123	37-123#	37-128	37-128	37-128	37-128	37-128
37-128	37-128#	37-128#	37-128#	37-128#	37-128#	37-130	37-130	37-130	37-130	37-130	37-130	37-130	37-130#
37-130#	37-130#	37-130#	37-130#	37-130#	37-131	37-131#	37-134	37-134	37-134	37-134	37-134	37-134	37-134#
37-134#	37-134#	37-134#	37-134#	37-135	37-135#	40-10	40-10	40-10#	40-10#	40-28	40-28	40-28#	40-28#
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53-43#	53-43#	53-44	53-44#	53-47	53-47	53-47#	53-47#	53-49	53-49#	53-56	53-56	53-56	53-56
53-56#	53-56#	53-56#	53-56#	53-56#	53-59	53-59	53-59	53-59	53-59	53-59	53-59#	53-59#	53-59#
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54-50	54-50	54-50#	54-50#	54-50#	54-50#	54-50#	54-52	54-52#	54-56	54-56#	54-59	54-59#	54-71
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56-52#	56-55	56-55#	56-76	56-76	56-76	56-76	56-76#	56-76#	56-76#	56-76#	56-76#	56-80	56-80#
56-82	56-82#	56-104	56-104	56-104	56-104	56-104#	56-104#	56-104#	56-104#	56-104#	56-109	56-109#	56-111
56-111#	56-132	56-132	56-132	56-132	56-132#	56-132#	56-132#	56-13?#	56-132#	56-136	56-136#	56-138	56-138#
56-144	56-144	56-144	56-144	56-144#	56-144#	56-144#	56-144#	56-144#	56-145	56-145	56-145	56-145	56-145
56-145#	56-145#	56-145#	56-145#	56-148	56-148#	56-150	56-150#	58-17	58-17#	58-19	58-19	58-19#	58-19#
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62-41#	62-41#	62-48	62-48	62-48	62-48	62-48#	62-48#	62-48#	62-48#	62-48#	62-51	62-51	62-51
62-51	62-51#	62-51#	62-51#	62-51#	62-51#	62-54	62-54#	63-17	63-17	63-17#	63-17#	63-23	63-23

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63-23 63-23 63-23 63-23 63-23# 63-23# 63-23# 63-23# 63-23# 63-23# 63-24 63-24 63-24 63-24
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CROSS REFERENCE TABLE (CREF V01-05

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70-77	70-77	70-77	70-77#	70-77#	70-77#	70-77#	70-77#	70-77#	70-78	70-78	70-78	70-78	70-78
70-78	70-78#	70-78#	70-78#	70-78#	70-78#	70-78#	70-79	70-79	70-79#	70-79#	70-98	70-98	70-98
70-98	70-98#	70-98#	70-98#	70-98#	70-98#	70-100	70-100	70-100	70-100	70-100	70-100#	70-100#	70-100#
70-100#	70-106	70-106	70-106	70-106	70-106#	70-106#	70-106#	70-106#	70-106#	70-109	70-109	70-109#	70-109#
70-111	70-111	70-111#	70-111#	70-112	70-112	70-112#	70-112#	70-113	70-113	70-113#	70-113#	70-115	70-115#
70-117	70-117#	70-119	70-119	70-119#	70-119#	70-125	70-125	70-125	70-125	70-125	70-125	70-125#	70-125#
70-125#	70-125#	70-125#	70-125#	70-126	70-126	70-126	70-126	70-126	70-126	70-126#	70-126#	70-126#	70-126#
70-126#	70-126#	70-127	70-127	70-127#	70-127#	70-146	70-146	70-146	70-146	70-146#	70-146#	70-146#	70-146#
70-146#	70-148	70-148	70-148	70-148	70-148	70-148#	70-148#	70-148#	70-148#	70-150	70-150	70-150	70-150
70-150	70-150#	70-150#	70-150#	70-150#	70-155	70-155	70-155	70-155	70-155#	70-155#	70-155#	70-155#	70-155#
70-158	70-158	70-158#	70-158#	70-160	70-160	70-160#	70-160#	70-161	70-161	70-161#	70-161#	70-162	70-162
70-162#	70-162#	70-164	70-164#	70-166	70-166#	72-26	72-26#	72-27	72-27#	72-29	72-29	72-29#	72-29#
72-49	72-49	72-49#	72-49#	72-52	72-52	72-52#	72-52#	72-53	72-53#	72-55	72-55#	72-57	72-57
72-57#	72-57#	72-71	72-71	72-71	72-71	72-71#	72-71#	72-71#	72-71#	72-71#	72-73	72-73#	72-74
72-74#	72-77	72-77#	72-78	72-78#	72-80	72-80	72-80#	72-80#	72-101	72-101	72-101#	72-101#	72-104
72-104	72-104#	72-104#	72-105	72-105#	72-107	72-107#	72-109	72-109	72-109#	72-109#	72-123	72-123	72-123
72-123	72-123#	72-123#	72-123#	72-123#	72-123#	72-124	72-124	72-124#	72-124#	72-126	72-126#	72-128	72-128#
72-130	72-130	72-130#	72-130#	72-140	72-140	72-140#	72-140#	72-143	72-143	72-143#	72-143#	72-144	72-144#
72-145	72-145#	72-148	72-148#	73-18	73-18#	73-20	73-20	73-20#	73-20#	73-41	73-41	73-41	73-41
73-41#	73-41#	73-41#	73-41#	73-41#	73-43	73-43#	73-45	73-45#	73-47	73-47	73-47#	73-47#	73-65
73-65	73-65	73-65	73-65#	73-65#	73-65#	73-65#	73-65#	73-65#	73-67	73-67#	73-69	73-69#	74-16	74-16
74-16#	74-16#	74-43	74-43#	75-15	75-15	75-15#	75-15#	75-38	75-38	75-38#	75-38#	75-45	75-45
75-45	75-45	75-45#	75-45#	75-45#	75-45#	75-45#	75-49	75-49#	76-28	76-28	76-28#	76-28#	76-39
76-39	76-39#	76-39#	76-46	76-46	76-46	76-46	76-46#	76-46#	76-46#	76-46#	76-46#	76-56	76-56#
77-18	77-18	77-18#	77-18#	77-37	77-37	77-37#	77-37#	77-43	77-43#	78-15	78-15	78-15#	78-15#
78-44	78-44#	79-15	79-15	79-15#	79-15#	79-44	79-44#	80-15	80-15	80-15#	80-15#	80-43	80-43#
81-18	81-18	81-18#	81-18#	81-38	81-38	81-38#	81-38#	81-41	81-41	81-41	81-41	81-41#	81-41#
81-41#	81-41#	81-41#	81-44	81-44#	83-19	83-19	83-19#	83-19#	83-39	83-39	83-39#	83-39#	83-42
83-42	83-42	83-42	83-42#	83-42#	83-42#	83-42#	83-42#	83-46	83-46#	84-23	84-23#	84-25	84-25
84-25#	84-25#	84-47	84-47	84-47#	84-47#	84-50	84-50	84-50	84-50	84-50#	84-50#	84-50#	84-50#
84-50#	84-52	84-52#	84-54	84-54#	84-56	84-56	84-56#	84-56#	84-80	84-80	84-80#	84-80#	84-88
84-88	84-88	84-88	84-88#	84-88#	84-88#	84-88#	84-88#	84-90	84-90#	84-92	84-92#	85-16	85-16
85-16#	85-16#	85-40	85-40	85-40	85-40	85-40#	85-40#	85-40#	85-40#	85-40#	85-44	85-44#	86-16
86-16	86-16#	86-16#	86-40	86-40	86-40	86-40	86-40#	86-40#	86-40#	86-40#	86-40#	86-44	86-44#
87-16	87-16	87-16#	87-16#	87-43	87-43	87-43	87-43	87-43#	87-43#	87-43#	87-43#	87-43#	87-58
87-58	87-58	87-58	87-58#	87-58#	87-58#	87-58#	87-58#	87-79	87-79	87-79	87-79	87-79#	87-79#
87-79#	87-79#	87-79#	87-102	87-102#	88-16	88-16	88-16#	88-16#	88-42	88-42#	89-16	89-16	89-16#
89-16#	89-42	89-42#	90-16	90-16	90-16#	90-16#	90-44	90-44#	91-16	91-16	91-16#	91-16#	91-42
91-42#	93-18	93-18	93-18#	93-18#	93-43	93-43#	94-16	94-16	94-16#	94-16#	94-43	94-43#	95-16
95-16	95-16#	95-16#	95-43	95-43#	96-16	96-16	96-16#	96-16#	96-46	96-46#	97-16	97-16	97-16#
97-16#	97-45	97-45#	98-16	98-16	98-16#	98-16#	98-46	98-46#	99-16	99-16	99-16#	99-16#	99-43
99-43#	100-18	100-18	100-18#	100-18#	100-38	100-38	100-38	100-38	100-38	100-38	100-38#	100-38#	100-38#
100-38#	100-38#	100-38#	100-39	100-39	100-39	100-39	100-39	100-39	100-39#	100-39#	100-39#	100-39#	100-39#
100-39#	100-40	100-40	100-40#	100-40#	100-45	100-45	100-45#	100-45#	100-52	100-52	100-52#	100-52#	100-57
100-57	100-57#	100-57#	100-61	100-61#	101-14	101-14	101-14#	101-14#	101-36	101-36	101-36	101-36	101-36
101-36	101-36#	101-36#	101-36#	101-36#	101-36#	101-36#	101-37	101-37	101-37	101-37	101-37	101-37	101-37#
101-37#	101-37#	101-37#	101-37#	101-37#	101-38	101-38	101-38#	101-38#	101-46	101-46	101-46	101-46	101-46
101-46#	101-46#	101-46#	101-46#	101-57	101-57#	102-14	102-14	102-14#	102-14#	102-35	102-35	102-35	102-35
102-35	102-35	102-35#	102-35#	102-35#	102-35#	102-35#	102-35#	102-36	102-36	102-36	102-36	102-36	102-36
102-36#	102-36#	102-36#	102-36#	102-36#	102-37	102-37	102-37#	102-37#	102-45	102-45	102-45	102-45	102-45

CROSS REFERENCE TABLE (CREF V01-05)

	102-45	102-45#	102-45#	102-45#	102-45#	102-57	102-57#	103-13	103-13#	103-15	103-15	103-15	103-15	103-15#
	103-16	103-16	103-16	103-16	103-16#	103-17	103-17	103-17	103-17	103-17	103-17#	103-18	103-18	103-18
	103-18#	103-20	103-20#	103-41	103-41	103-41	103-41#	103-41#	103-41#					
MSGNLS	1-C13#	17-15#	72-53	72-53#	72-73	72-73#	72-105	72-105#	72-126	72-126#	72-144	72-144#		
MSGNSU	1-B98#	17-15#	54-26	54-26#	54-56	54-56#	56-25	56-25#	56-55	56-55#	56-82	56-82#	56-111	56-111#
	56-138	56-138#	58-17	58-17#	58-51	58-51#	59-14	59-14#	59-31	59-31#	64-31	64-31#	64-83	64-83#
	64-155	64-155#	65-16	65-16#	65-70	65-70#	65-130	65-130#	69-37	69-37#	69-57	69-57#	69-78	69-78#
	69-97	69-97#	69-122	69-122#	69-147	69-147#	70-21	70-21#	70-69	70-69#	70-117	70-117#	72-26	72-26#
	72-77	72-77#	73-18	73-18#	73-45	73-45#	84-23	84-23#	84-54	84-54#				
MSGNTA	1-B90#	17-15#	20-15	20-15#	37-10	37-10#	37-20	37-20#	37-25	37-25#	37-32	37-32#	37-39	37-39#
	37-45	37-45#	37-51	37-51#	37-57	37-57#	37-76	37-76#	37-81	37-81#	37-123	37-123#	37-131	37-131#
	37-135	37-135#	40-126	40-126#	41-27	41-27#	42-14	42-14#	43-59	43-59#	44-74	44-74#	45-38	45-38#
	46-44	46-44#	47-66	47-66#	48-39	48-39#	49-49	49-49#	50-22	50-22#	51-13	51-13#	53-49	53-49#
	53-60	53-60#	54-52	54-52#	54-73	54-73#	54-75	54-75#	56-52	56-52#	56-80	56-80#	56-109	56-109#
	56-136	56-136#	56-148	56-148#	56-150	56-150#	58-48	58-48#	58-79	58-79#	58-82	58-82#	59-28	59-28#
	59-55	59-55#	59-58	59-58#	60-46	60-46#	62-54	62-54#	63-65	63-65#	64-81	64-81#	64-151	64-151#
	64-208	64-208#	64-212	64-212#	65-68	65-68#	65-126	65-126#	65-187	65-187#	65-190	65-190#	66-60	66-60#
	68-67	68-67#	69-54	69-54#	69-74	69-74#	69-94	69-94#	69-119	69-119#	69-144	69-144#	69-170	69-170#
	69-181	69-181#	70-67	70-67#	70-115	70-115#	70-164	70-164#	70-166	70-166#	72-74	72-74#	72-145	72-145#
	72-148	72-148#	73-43	73-43#	73-67	73-67#	73-69	73-69#	74-43	74-43#	75-49	75-49#	76-56	76-56#
	77-43	77-43#	78-44	78-44#	79-44	79-44#	80-43	80-43#	81-44	81-44#	83-46	83-46#	84-52	84-52#
	84-90	84-90#	84-92	84-92#	85-44	85-44#	86-44	86-44#	87-102	87-102#	88-42	88-42#	89-42	89-42#
	90-44	90-44#	91-42	91-42#	93-43	93-43#	94-43	94-43#	95-43	95-43#	96-46	96-46#	97-45	97-45#
	98-46	98-46#	99-43	99-43#	100-61	100-61#	101-57	101-57#	102-57	102-57#	103-20	103-20#		
MSGNTE	1-B94#	17-15#	53-20	53-20#	54-25	54-25#	56-21	56-21#	58-15	58-15#	59-12	59-12#	60-10	60-10#
	62-18	62-18#	63-13	63-13#	64-29	64-29#	65-13	65-13#	66-12	66-12#	68-15	68-15#	69-23	69-23#
	70-16	70-16#	72-24	72-24#	73-17	73-17#	74-13	74-13#	75-12	75-12#	76-13	76-13#	77-15	77-15#
	78-12	78-12#	79-12	79-12#	80-12	80-12#	81-15	81-15#	83-15	83-15#	84-21	84-21#	85-12	85-12#
	86-12	86-12#	87-12	87-12#	88-12	88-12#	89-12	89-12#	90-12	90-12#	91-12	91-12#	93-14	93-14#
	94-12	94-12#	95-12	95-12#	96-12	96-12#	97-12	97-12#	98-12	98-12#	99-12	99-12#	100-14	100-14#
	101-12	101-12#	102-12	102-12#										
MSHAPT	1-A39#	17-15#	18-11	18-11#										
MSHNAP	1-B24#	17-15#	18-11	18-11#										
MSINCR	1-D26#	17-15#	17-18	17-18#	20-8	20-8	20-8#	20-8#	27-41#	27-46#	27-49#	28-37#	28-48#	30-54#
	30-55#	30-56#	30-81#	30-89#	30-93#	30-100#	30-112#	30-113#	31-48#	31-55#	31-72#	32-35#	32-36#	32-40#
	32-44#	32-45#	32-46#	32-55#	32-58#	32-70#	32-73#	33-33#	34-37#	37-8	37-8	37-8#	37-8#	37-9#
	37-10#	37-13	37-13	37-13#	37-13#	37-16#	37-18#	37-19#	37-20#	37-22	37-22	37-22#	37-22#	37-23#
	37-24#	37-25#	37-28	37-28	37-28#	37-28#	37-29#	37-30#	37-31#	37-32#	37-35	37-35	37-35#	37-35#
	37-36#	37-37#	37-38#	37-39#	37-41	37-41	37-41#	37-41#	37-42#	37-43#	37-44#	37-45#	37-47	37-47
	37-47#	37-47#	37-48#	37-49#	37-50#	37-51#	37-53	37-53	37-53#	37-53#	37-54#	37-55#	37-56#	37-57#
	37-60	37-60	37-60#	37-60#	37-63#	37-65#	37-66#	37-67#	37-68#	37-69#	37-70#	37-71#	37-72#	37-73#
	37-74#	37-75#	37-76#	37-78	37-78	37-78#	37-78#	37-79#	37-80#	37-81#	37-83	37-83	37-83#	37-83#
	37-87#	37-93#	37-99#	37-100#	37-101#	37-108#	37-109#	37-110#	37-111#	37-112#	37-116#	37-117#	37-118#	37-121#
	37-123#	37-125	37-125	37-125#	37-125#	37-128#	37-130#	37-131#	37-133	37-133	37-133#	37-133#	37-134#	37-135#
	39-8	39-8	39-8#	39-8#	40-8	40-8	40-8#	40-8#	40-10#	40-28#	40-30#	40-32#	40-34#	40-36#
	40-51#	40-57#	40-86#	40-126#	41-8	41-8	41-8#	41-8#	41-10#	41-22#	41-23#	41-24#	41-27#	42-9
	42-9	42-9#	42-9#	42-14#	43-30	43-30	43-30#	43-30#	44-24	44-24	44-24#	44-24#	45-20	45-20
	45-20#	45-20#	46-22	46-22	46-22#	46-22#	47-26	47-26	47-26#	47-26#	48-18	48-18	48-18#	48-18#
	49-22	49-22	49-22#	49-22#	50-18	50-18	50-18#	50-18#	51-8	51-8	51-8#	51-8#	51-10#	51-11#
	51-13#	53-20	53-20	53-20	53-20#	53-20#	53-20#	53-22#	53-42#	53-43#	53-44#	53-47#	53-49#	53-52
	53-52	53-52#	53-52#	53-56#	53-59#	54-25	54-25	54-25	54-25#	54-25#	54-25#	54-26	54-26	54-26
	54-26#	54-26#	54-26#	54-28#	54-50#	54-52#	54-56	54-56	54-56	54-56#	54-56#	54-56#	54-59#	54-71#
	54-73#	54-75#	56-21	56-21	56-21	56-21#	56-21#	56-21#	56-23#	56-25	56-25	56-25	56-25#	56-25#
	56-25#	56-48#	56-52#	56-55	56-55	56-55	56-55#	56-55#	56-55#	56-76#	56-80#	56-82	56-82	56-82
	56-82#	56-82#	56-82#	56-104#	56-109#	56-111	56-111	56-111	56-111#	56-111#	56-111#	56-132#	56-136#	56-138
	56-138	56-138	56-138#	56-138#	56-138#	56-144#	56-145#	56-148#	56-150#	58-15	58-15	58-15	58-15#	58-15#
	58-15#	58-17	58-17	58-17	58-17#	58-17#	58-17#	58-19#	58-27#	58-32#	58-39#	58-43#	58-46#	58-48#

CROSS REFERENCE TABLE (CREF V01-05)

58-51	58-51	58-51	58-51#	58-51#	58-51#	58-53#	58-61#	58-66#	58-7 #	58-74#	58-77#	58-79#	53-82#
59-12	59-12	59-12	59-12#	59-12#	59-12#	59-14	59-14	59-14	59-14#	59-14#	59-14#	59-16#	59-26#
59-28#	59-31	59-31	59-31	59-31#	59-31#	59-31#	59-33#	59-42#	59-46#	59-53#	59-55#	59-58#	60 :0
60-10	60-10	60-10#	60-10#	60-10#	60-13#	60-17#	60-18#	60-33#	60-40#	60-42#	60-44#	60-46#	62-18
62-18	62-18	62-18#	62 :8#	62-18#	62-21#	62-28#	62-33#	62-38#	62-41#	62-48#	62-51#	62-54#	63-13
63-13	63-13	63-13#	63-13#	63-13#	63-17#	63-23#	63-24#	63-25#	63-44#	63-54#	63-57#	63-60#	63-62#
63-63#	63-65#	64-29	64-29	64-29	64-29#	64-29#	64-29#	64-31	64-31	64-31	64-31#	64-31#	64-31#
64-33#	64-37#	64-38#	64-54#	64-67#	64-72#	64-77#	64-81#	64-83	64-83	64-83	64-83#	64-83#	64-83#
64-85#	64-90#	64-91#	64-107#	64-117#	64-124#	64-130#	64-138#	64-148#	64-151#	64-155	64-155	64-155	64-155#
64-155#	64-155#	64-157#	64-162#	64-163#	64-179#	64-192#	64-199#	64-205#	64-208#	64-212#	65-13	65-13	65-13
65-13#	65-13#	65-13#	65-16	65-16	65-16	65-16#	65-16#	65-16#	65-18#	65-24#	65-25#	65-26#	65-42#
65-51#	65-57#	65-61#	65-63#	65-65#	65-66#	65-68#	65-70	65-70	65-70	65-70#	65-70#	65-70#	65-72#
65-80#	65-81#	65-82#	65-98#	65-107#	65-114#	65-118#	65-120#	65-122#	65-123#	65-126#	65-130	65-130	65-130
65-130#	65-130#	65-130#	65-132#	65-140#	65-141#	65-142#	65-158#	65-167#	65-173#	65-179#	65-181#	65-183#	65-187#
65-190#	66-12	66-12	66-12	66-12#	66-12#	66-12#	66-15#	66-19#	66-20#	66-21#	66-43#	66-49#	66-53#
66-55#	66-56#	66-60#	68-15	68-15	68-15	68-15#	68-15#	68-15#	68-20#	68-45#	68-65#	68-67#	69-23
69-23	69-23	69-23#	69-23#	69-23#	69-26#	69-29#	69-30#	69-37	69-37	69-37	69-37#	69-37#	69-37#
69-39#	69-50#	69-54#	69-57	69-57	69-57	69-57#	69-57#	69-57#	69-59#	69-70#	69-74#	69-78	69-78
69-78	69-78#	69-78#	69-78#	69-80#	69-90#	69-94#	69-97	69-97	69-97	69-97#	69-97#	69-97#	69-99#
69-110#	69-111#	69-116#	69-119#	69-122	69-122	69-122	69-122#	69-122#	69-122#	69-124#	69-135#	69-136#	69-141#
69-144#	69-147	69-147	69-147	69-147#	69-147#	69-147#	69-149#	69-160#	69-161#	69-162#	69-167#	69-170#	69-175#
69-177#	69-178#	69-181#	70-16	70-16	70-16	70-16#	70-16#	70-16#	70-19#	70-21	70-21	70-21	70-21#
70-21#	70-21#	70-23#	70-29#	70-30#	70-31#	70-50#	70-52#	70-58#	70-61#	70-63#	70-64#	70-65#	70-67#
70-69	70-69	70-69	70-69#	70-69#	70-69#	70-71#	70-77#	70-78#	70-79#	70-98#	70-100#	70-106#	70-109#
70-111#	70-112#	70-113#	70-115#	70-117	70-117	70-117	70-117#	70-117#	70-117#	70-119#	70-125#	70-126#	70-127#
70-146#	70-148#	70-150#	70-155#	70-158#	70-160#	70-161#	70-162#	70-164#	70-166#	72-24	72-2	72-24	72-24#
72-24#	72-24#	72-26	72-26	72-26	72-26#	72-26#	72-26#	72-27	72-27	72-27	72-27#	72-27#	72-27#
72-27#	72-29#	72-49#	72-52#	72-53#	72-55	72-55	72-55	72-55#	72-55#	72-55#	72-55#	72-57#	72-71#
72-73#	72-74#	72-77	72-77	72-77	72-77#	72-77#	72-77#	72-78	72-78	72-78	72-78#	72-78#	72-78#
72-78#	72-80#	72-101#	72-104#	72-105#	72-107	72-107	72-107	72-107#	72-107#	72-107#	72-107#	72-109#	72-123#
72-124#	72-126#	72-128	72-128	72-128	72-128#	72-128#	72-128#	72-128#	72-130#	72-140#	72-143#	72-144#	72-145#
72-148#	73-17	73-17	73-17	73-17#	73-17#	73-17#	73-18	73-18	73-18	73-18#	73-18#	73-18#	73-20#
73-41#	73-43#	73-45	73-45	73-45	73-45#	73-45#	73-45#	73-47#	73-65#	73-67#	73-69#	74-13	74-13
74-13	74-13#	74-13#	74-13#	74-16#	74-43#	75-12	75-12	75-12	75-12#	75-12#	75-12#	75-15#	75-38#
75-45#	75-49#	76-13	76-13	76-13	76-13#	76-13#	76-13#	76-28#	76-39#	76-46#	76-56#	77-15	77-15
77-15	77-15#	77-15#	77-15#	77-18#	77-37#	77-43#	78-12	78-12	78-12	78-12#	78-12#	78-12#	78-15#
78-44#	79-12	79-12	79-12	79-12#	79-12#	79-12#	79-15#	79-44#	80-12	80-12	80-12	80-12#	80-12#
80-1 #	80-15#	80-43#	81-15	81-15	81-15	81-15#	81-15#	81-15#	81-18#	81-38#	81-41#	81-44#	83-15
83-15	83-15	83-15#	83-15#	83-15#	83-19#	83-39#	83-42#	83-46#	84-2	84-21	84-21	84-21#	84-21#
84-21#	84-23	84-23	84-23	84-23#	84-23#	84-23#	84-25#	84-47#	84-50#	84-52#	84-54	84-54	84-54
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85-16#	85-40#	85-44#	86-12	86-12	86-12	86-12#	86-12#	86-12#	86-16#	86-40#	86-44#	87-12	87-12
87-12	87-12#	87-12#	87-12#	87-16#	87-43#	87-58#	87-79#	87-102#	88-12	88-12	88-12	88-12#	88-12#
88-12#	88-16#	88-42#	89-12	89-12	89-12	89-12#	89-12#	89-12#	89-16#	89-42#	90-12	90-12	90-12
90-12#	90-12#	90-12#	90-16#	90-44#	91-12	91-12	91-12	91-12#	91-12#	91-12#	91-16#	91-42#	93-14
93-14	93-14	93-14#	93-14#	93-14#	93-18#	93-43#	94-12	94-12	94-12	94-12#	94-12#	94-12#	94-16#
94-43#	95-12	95-12	95-12	95-12#	95-12#	95-12#	95-16#	95-43#	96-12	96-12	96-12	96-12#	96-12#
96-12#	96-16#	96-46#	97-12	97-12	97-12	97-12#	97-12#	97-12#	97-16#	97-45#	98-12	98-12	98-12
98-12#	98-12#	98-12#	98-16#	98-46#	99-12	99-12	99-12	99-12#	99-12#	99-12#	99-16#	99-43#	100-14
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102-12#	102-12#	102-12#	102-14#	102-35#	102-36#	102-37#	102-45#	102-57#	103-13	103-13	103-13#	103-13#	
MSIOSE 1-A00#	17-15#												
MSLDRO 1-C42#	17-15#	30-56	30-56#	30-112	30-112#	30-113	30-113#	40-10	40-10#	40-28	40-28#	40-30	40-30#
40-32	40-32#	40-34	40-34#	40-36	40-36#	40-51	40-51#	41-22	41-22#	41-24	41-24#	53-43	53-43#
53-47	53-47#	60-18	60-18#	60-42	60-42#	60-44	60-44#	63-25	63-25#	63-60	63-60#	63-62	63-62#
63-63	63-63#	64 38	64-38#	64-91	64-91#	64-163	64-163#	65-26	65-26#	65-63	65-63#	65-65	65-65#

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        65-183   65-183#  66-21    66-21#   66-53    66-53#   66-55    66-55#   66-56    66-56#   69-30    69-30#   69-175   69-175#
        69-177   69-177#  69-178   69-178#  70-31    70-31#   70-61    70-61#   70-63    70-63#   70-64    70-64#   70-79    70-79#
        70-109   70-109#  70-111   70-111#  70-112   70-112#  70-127   70-127#  70-158   70-158#  70-160   70-160#  70-161   70-161#
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MSMCLO   1-a24#  17-15    17-15#   17-15#
MSMSK1   1-a77#  17-15#
MSPOP    1-881#  17-15#   20-15    20-15#   37-10    37-10#   37-20    37-20#   37-25    37-25#   37-32    37-32#   37-39    37-39#
        37-45    37-45#   37-51    37-51#   37-57    37-57#   37-76    37-76#   37-81    37-81#   37-123   37-123#  37-131   37-131#
        37-135   37-135#  39-14    39-14#   40-126   40-126#  41-27    41-27#   42-14    42-14#   43-59    43-59#   44-7     44-74#
        45-38    45-38#   46-44    46-44#   47-66    47-66#   48-39    48-39#   49-49    49-49#   50-22    50-22#   51-13    51-13#
        53-49    53-49#   53-60    53-60#   54-52    54-52#   54-73    54-73#   54-75    54-75#   56-52    56-52#   56-80    56-80#
        56-109   56-109#  56-136   56-136#  56-148   56-148#  56-150   56-150#  58-48    58-48#   58-79    58-79#   58-82    58-82#
        59-28    59-28#   59-55    59-55#   59-58    59-5 #   60-46    60-46#   62-54    62-54#   63-65    63-65#   64-81    64-81#
        64-151   64-151#  64-208   64-208#  64-212   64-212#  65-68    65-68#   65-126   65-126#  65-187   65-187#  65-190   65-190#
        66-60    66-60#   68-67    68-67#   69-54    69-54#   69-74    69-74#   69-94    69-94#   69-119   69-119#  69-144   69-144#
        69-170   69-170#  69-181   69-181#  70-67    70-67#   70-115   70-115#  70-164   70-164#  70-166   70-166#  72-53    72-53
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        72-144#  72-145   72-145#  72-148   72-148#  73-43    73-43#   73-67    73-67#   73-69    73-69#   74-43    74-43#   75-49
        75-4 #   76-56    76-56#   77-43    77-43#   78-44    78-44#   79-44    79-44#   80-43    80-43#   81-44    81-44#   83-46
        83-46#   84-52    84-52#   84-90    84-90#   84-92    84-92#   85-44    85-44#   86-44    86-44#   87-102   87-102#  88-42
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        96-46#   97-45    97-45#   98-46    98-46#   99-43    99-43#   100-61   100-61#  101-57   101-57#  102-57   102-57#  103-20
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MSPRIN   1-a36#  17-15#   27-49    27-49#   28-48    28-48#   32-36    32-36#   32-40    32-40#   32-44    32-44#   32-45    32-45#
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        37-30    37-30#   37-31    37-31#   37-36    37-36#   37-37    37-37#   37-38    37-38#   37-42    37-42#   37-43    37-43#
        37-44    37-44#   37-48    37-48#   37-49    37-49#   37-50    37-50#   37-54    37-54#   37-55    37-55#   37-56    37-56#
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        37-71    37-71#   37-72    37-72#   37-73    37-73#   37-74    37-74#   37-75    37-75#   37-79    37-79#   37-80    37-80#
        37-87    37-87#   37-93    37-93#   37-99    37-99#   37-100   37-100#  37-101   37-101#  37-108   37-108#  37-109   37-109#
        37-110   37-110#  37-111   37-111#  37-112   37-112#  37-116   37-116#  37-117   37-117#  37-118   37-118#  37-121   37-121#
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        53-59    53-59#   56-145   56-145#  69-111   69-111#  69-136   69-136#  69-161   69-161#  69-162   69-162#  70-52    70-52#
        70-100   70-100#  70-148   70-148#  70-150   70-150#  101-46   101-46#  102-45   102-45#
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        37-35    37-35#   37-41    37-41#   37-47    37-47#   37-53    37-53#   37-60    37-60#   37-78    37-78#   37-83    37-83#
        37-125   37-125#  37-133   37-133#  39-8     39-8#    40-8     40-8#    41-8     41-8#    42-9     42-9#    43-30    43-30#
        44-24    44-24#   45-20    45-20#   46-22    46-22#   47-26    47-26#   48-18    48-18#   49-22    49-22#   50-18    50-18#
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        56-25    56-25#   56-55    56-55#   56-82    56-82#   56-111   56-111#  56-138   56-138#  58-15    58-15#   58-17    58-17#
        58-51    58-51#   59-12    59-12#   59-14    59-14#   59-31    59-31#   60-10    60-10#   62-18    62-18#   63-13    63-13#
        64-29    64-29#   64-31    64-31#   64-8     64-83#   64-155   64-155#  65-13    65-13#   65-16    65-16#   65-70    65-70#
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        87-12#   88-12    88-12#   89-12    89-12#   90-12    90-12#   91-12    91-12#   93-14    93-14#   94-12    94-12#   95-12
        95-12#   96-12    96-12#   97-12    97-12#   98-12    98-12#   99-12    99-12#   100-14   100-14#  101-12   101-12#  102-12
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            37-37    37-37    37-37    37-37    37-37#   37-38    37-38    37-38    37-38#   37-42    37-42    37-42#   37-43    37-43
            37-43    37-43    37-43#   37-44    37-44    37-44    37-44#   37-48    37-48    37-48#   37-49    37-49    37-49    37-49
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           102-36   102-36#  102-45   102-45   102-45#
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            32-36    32-36#   32-36#   32-36#   32-40    32-40    32-40#   32-40#   32-44    32-44    32-44#   32-44#   32-45    32-45
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            33-33#   33-33#   33-33#   33-33#   34-37    34-37    34-37    34-37#   34-37#   34-37#   37-9     37-9     37-9     37-9#
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            37-36    37-36    37-36#   37-36#   37-37    37-37    37-37    37-37    37-37#   37-37#   37-37#   37-37#   37-38    37-38
            37-38    37-38#   37-38#   37-38#   37-42    37-42    37-42#   37-42#   37-43    37-43    37-43    37-43    37-43#   37-43#
            37-43#   37-43#   37-44    37-44    37-44    37-44#   37-44#   37-44#   37-48    37-48    37-48#   37-48#   37-49    37-49
            37-49    37-49    37-49#   37-49#   37-49#   37-49#   37-50    37-50    37-50    37-50#   37-50#   37-50#   37-54    37-54
            37-54#   37-54#   37-55    37-55    37-55    37-55    37-55#   37-55#   37-55#   37-55#   37-56    37-56    37-56    37-56#
            37-56#   37-56#   37-63    37-63    37-63    37-63#   37-63#   37-63#   37-65    37-65    37-65#   37-65#   37-66    37-66
            37-66    37-66    37-66#   37-66#   37-66#   37-66#   37-67    37-67    37-67    37-67#   37-67#   37-67#   37-68    37-68
            37-68    37-68    37-68#   37-68#   37-68#   37-68#   37-69    37-69    37-69    37-69#   37-69#   37-69#   37-70    37-70
            37-70    37-70    37-70#   37-70#   37-70#   37-70#   37-71    37-71    37-71    37-71#   37-71#   37-71#   37-72    37-72
            37-72    37-72    37-72#   37-72#   37-72#   37-72#   37-73    37-73    37-73    37-73#   37-73#   37-73#   37-74    37-74
            37-74    37-74    37-74#   37-74#   37-74#   37-74#   37-75    37-75    37-75    37-75#   37-75#   37-75#   37-79    37-79
            37-79    37-79#   37-79#   37-79#   37-80    37-80    37-80    37-80    37-80    37-80#   37-80#   37-80#   37-80#   37-80#
            37-87    37-87    37-87#   37-87#   37-93    37-93    37-93#   37-93#   37-99    37-99    37-99#   37-99#   37-100   37-100
           37-100#  37-100#  37-101   37-101   37-101#  37-101#  37-108   37-108   37-108#  37-108#  37-109   37-109   37-109#  37-109#
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CROSS REFERENCE TABLE (CREF V01-03)

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            37-128    37-128    37-128    37-128#   37-128#   37-128#   37-130    37-130    37-130    37-130    37-130#   37-130#   37-130#   37-130#
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            40-86     40-86     40-86     40-86     40-86#    40-86#    40-86#    40-86#    41-10     41-10     41-10     41-10     41-10#    41-10#
            41-10#    41-10#    51-11     51-11     51-11     51-11#    51-11#    51-11#    53-22     53-22     53-22     53-22     53-22#    53-22#
            53-22#    53-22#    53-42     53-42     53-42#    53-42#    53-59     53-59     53-59     53-59     53-59#    53-59#    53-59#    53-59#
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            63-23     63-23     63-23#    63-23#    63-23#    63-23#    63-24     63-24     63-24     63-24     63-24#    63-24#    63-24#    63-24#
            64-37     64-37     64-37     64-37     64-37#    64-37#    64-37#    64-37#    64-90     64-90     64-90     64-90     64-90#    64-90#
            64-90#    64-90#    64-162    64-162    64-162    64-162    64-162#   64-162#   64-162#   64-162#   65-24     65-24     65-24     65-24
            65-24#    65-24#    65-24#    65-24#    65-25     65-25     65-25     65-25     65-25#    65-25#    65-25#    65-25#    65-80     65-80
            65-80     65-80     65-80#    65-80#    65-80#    65-80#    65-81     65-81     65-81     65-81     65-81#    65-81#    65-81#    65-81#
            65-140    65-140    65-140    65-140    65-140#   65-140#   65-140#   65-140#   65-141    65-141    65-141    65-141    65-141#   65-141#
            65-141#   65-141#   66-19     66-19     66-19     66-19     66-19#    66-19#    66-19#    66-19#    66-20     66-20     66-20     66-20
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            69-111#   69-1..#   69-136    69-136    69-136#   69-136#   69-161    69-161    69-161#   69-161#   69-162    69-162    69-162#   69-162#
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            70-30#    70-30#    70-52     70-52     70-52#    70-52#    70-77     70-77     70-77     70-77     70-77#    70-77#    70-77#    70-77#
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            70-125    70-125    70-125#   70-125#   70-125#   70-125#   70-126    70-126    70-126    70-126    70-126#   70-126#   70-126#   70-126#
            70-148    70-148    70-148#   70-148#   70-150    70-150    70-150#   70-150#   100-38    100-38    100-38    100-38    100-38#   100-38#
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           101-36#   101-36#   101-36#   101-36#   101-37    101-37    101-37    101-37    101-37#   101-37#   101-37#   101-37#   101-46    101-46
           101-46#   101-46#   102-35    102-35    102-35    102-35    102-35#   102-35#   102-35#   102-35#   102-36    102-36    102-36    102-36
           102-36#   102-36#   102-36#   102-36#   102-45    102-45    102-45#   102-45#
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MSRNRO      1-C62#   17-15#    40-51     40-51#
MSSETS      1-D32#   17-15#    17-18     17-18#    20-8      20-8#     37-8      37-8#     37-13     37-13#    37-22     37-22#    37-28     37-28#
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            69-97    69-97#    69-122    69-122#   69-147    69-147#   70-16     70-16#    70-21     70-21#    70-69     70-69#    70-117    70-117#
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            72-78    72-78     72-78#    72-78#    72-107    72-107    72-107#   72-107#   72-128    72-128    72-128#   72-128#   73-17     73-17#
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            79-12    79-12#    80-12     80-12#    81-15     81-15#    83-15     83-15#    84-21     84-21#    84-23     84-23#    84-54     84-54#
            85-12    85-12#    86-12     86-12#    87-12     87-12#    88-12     88-12#    89-12     89-12#    90-12     90-12#    91-12     91-12#
            93-14    93-14#    94-12     94-12#    95-12     95-12#    96-12     96-12#    97-12     97-12#    98-12     98-12#    99-12     99-12#
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MSSTAR      1-A33#   17-15#
MSSVC       1-C33#   17-15#    27-41     27-41#    27-46     27-49     27-49#    28-37     28-48     28-48#    30-54     30-54#    30-55     30-55#
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            32-35    32-36     32-36#    32-40     32-40#    32-44     32-44#    32-45     32-45#    32-46     32-46#    32-55     32-55#    32-58
            32-58#   32-70     32-70#    32-73     32-73#    33-33     33-33#    34-37     34-37#    37-9      37-9#     37-10     37-10#    37-16
            37-16#   37-18     37-18#    37-19     37-19#    37-20     37-20#    37-23     37-23#    37-24     37-24#    37-25     37-25#    37-29
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            37-39#   37-42     37-42#    37-43     37-43#    37-44     37-44#    37-45     37-45#    37-48     37-48#    37-49     37-49#    37-50
            37-50#   37-51     37-51#    37-54     37-54#    37-55     37-55#    37-56     37-56#    37-57     37-57#    37-63     37-63#    37-65
            37-65#   37-66     37-66#    37-67     37-67#    37-68     37-68#    37-69     37-69#    37-70     37-70#    37-71     37-71#    37-72
            37-72#   37-73     37-73#    37-74     37-74#    37-75     37-75#    37-76     37-76#    37-79     37-79#    37-80     37-80#    37-81
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CROSS REFERENCE TABLE (CREF V01-05)

	37-81#	37-87	37-87#	37-93	37-93#	37-99	37-99#	37-100	37-100#	37-101	37-101#	37-108	37-108#	37-109
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	37-121#	37-123	37-123#	37-128	37-128#	37-130	37-130#	37-131	37-131#	37-134	37-134#	37-135	37-135#	40-10
	40-10#	40-28	40-28#	40-30	40-30#	40-32	40-32#	40-34	40-34#	40-36	40-36#	40-51	40-51#	40-57
	40-57#	40-86	40-86#	40-126	40-126#	41-10	41-10#	41-22	41-22#	41-23	41-23#	41-24	41-24#	41-27
	41-27#	42-14	42-14#	51-10	51-10#	51-11	51-11#	51-13	51-13#	53-22	53-22#	53-42	53-42#	53-43
	53-43#	53-44	53-44#	53-47	53-47#	53-49	53-49#	53-56	53-59	53-59#	54-26	54-26#	54-28	54-28#
	54-50	54-52	54-52#	54-56	54-56#	54-59	54-59#	54-71	54-73	54-73#	54-75	54-75#	56-23	56-23#
	56-25	56-25#	56-48	56-52	56-52#	56-55	56-55#	56-76	56-80	56-80#	56-82	56-82#	56-104	56-109
	56-109#	56-111	56-111#	56-132	56-136	56-136#	56-138	56-138#	56-144	56-145	56-145#	56-148	56-149#	56-150
	56-150#	58-17	58-17#	58-19	58-19#	58-27	58-27#	58-32	58-39	58-39#	58-43	58-46	58-46#	58-48
	58-48#	58-51	58-51#	58-53	58-53#	58-61	58-61#	58-66	58-70	58-70#	58-74	58-77	58-77#	58-79
	58-79#	58-82	58-82#	59-14	59-14#	59-16	59-16#	59-26	59-28	59-28#	59-31	59-31#	59-33	59-33#
	59-42	59-42#	59-46	59-46#	59-53	59-55	59-55#	59-58	59-58#	60-13	60-13#	60-17	60-17#	60-18
	60-18#	60-33	60-40	60-42	60-42#	60-44	60-44#	60-46	60-46#	62-21	62-21#	62-28	62-28#	62-33
	62-33#	62-38	62-38#	62-41	62-48	62-51	62-54	62-54#	63-17	63-17#	63-23	63-23#	63-24	63-24#
	63-25	63-25#	63-44	63-54	63-57	63-60	63-60#	63-62	63-62#	63-63	63-63#	63-65	63-65#	64-31
	64-31#	64-33	64-33#	64-37	64-37#	64-38	64-38#	64-54	64-67	64-72	64-77	64-81	64-81#	64-83
	64-83#	64-85	64-85#	64-90	64-90#	64-91	64-91#	64-107	64-117	64-124	64-130	64-138	64-148	64-151
	64-151#	64-155	64-155#	64-157	64-157#	64-162	64-162#	64-163	64-163#	64-179	64-192	64-199	64-205	64-208
	64-208#	64-212	64-212#	65-16	65-16#	65-18	65-18#	65-24	65-24#	65-25	65-25#	65-26	65-26#	65-42
	65-51	65-57	65-61	65-63	65-63#	65-65	65-65#	65-66	65-66#	65-68	65-68#	65-70	65-70#	65-72
	65-72#	65-80	65-80#	65-81	65-81#	65-82	65-82#	65-98	65-107	65-114	65-118	65-120	65-120#	65-122
	65-122#	65-123	65-123#	65-126	65-126#	65-130	65-130#	65-132	65-132#	65-140	65-140#	65-141	65-141#	65-142
	65-142#	65-158	65-167	65-173	65-179	65-181	65-181#	65-183	65-183#	65-187	65-187#	65-190	65-190#	66-15
	66-15#	66-19	66-19#	66-20	66-20#	66-21	66-21#	66-43	66-49	66-53	66-53#	66-55	66-55#	66-56
	66-56#	66-60	66-60#	68-20	68-20#	68-45	68-65	68-67	68-67#	69-26	69-26#	69-29	69-29#	69-30
	69-30#	69-37	69-37#	69-39	69-39#	69-50	69-54	69-54#	69-57	69-57#	69-59	69-59#	69-70	69-74
	69-74#	69-78	69-78#	69-80	69-80#	69-90	69-94	69-94#	69-97	69-97#	69-99	69-99#	69-110	69-111
	69-111#	69-116	69-119	69-119#	69-122	69-122#	69-124	69-124#	69-135	69-136	69-136#	69-141	69-144	69-144#
	69-147	69-147#	69-149	69-149#	69-160	69-161	69-161#	69-162	69-162#	69-167	69-170	69-170#	69-175	69-175#
	69-177	69-177#	69-178	69-178#	69-181	69-181#	70-19	70-19#	70-21	70-21#	70-23	70-23#	70-29	70-29#
	70-30	70-30#	70-31	70-31#	70-50	70-52	70-52#	70-58	70-61	70-61#	70-63	70-63#	70-64	70-64#
	70-65	70-65#	70-67	70-67#	70-69	70-69#	70-71	70-71#	70-77	70-77#	70-78	70-78#	70-79	70-79#
	70-98	70-100	70-100#	70-106	70-109	70-109#	70-111	70-111#	70-112	70-112#	70-113	70-113#	70-115	70-115#
	70-117	70-117#	70-119	70-119#	70-125	70-125#	70-126	70-126#	70-127	70-127#	70-146	70-148	70-148#	70-150
	70-150#	70-155	70-158	70-158#	70-160	70-160#	70-161	70-161#	70-162	70-162#	70-164	70-164#	70-166	70-166#
	72-26	72-26#	72-27	72-27#	72-29	72-29#	72-49	72-49#	72-52	72-52#	72-53	72-53#	72-55	72-55#
	72-57	72-57#	72-71	72-73	72-73#	72-74	72-74#	72-77	72-77#	72-78	72-78#	72-80	72-80#	72-101
	72-101#	72-104	72-104#	72-105	72-105#	72-107	72-107#	72-109	72-109#	72-123	72-124	72-124#	72-126	72-126#
	72-128	72-128#	72-130	72-130#	72-140	72-140#	72-143	72-143#	72-144	72-144#	72-145	72-145#	72-148	72-148#
	73-18	73-18#	73-20	73-20#	73-41	73-43	73-43#	73-45	73-45#	73-47	73-47#	73-65	73-67	73-67#
	73-69	73-69#	74-16	74-16#	74-43	74-43#	75-15	75-15#	75-38	75-38#	75-45	75-49	75-49#	76-28
	76-28#	76-39	76-39#	76-46	76-56	76-56#	77-18	77-18#	77-37	77-37#	77-43	77-43#	78-15	78-15#
	78-44	78-44#	79-15	79-15#	79-44	79-44#	80-15	80-15#	80-43	80-43#	81-18	81-18#	81-38	81-38#
	81-41	81-44	81-44#	83-19	83-19#	83-39	83-39#	83-42	83-46	83-46#	84-23	84-23#	84-25	84-25#
	84-47	84-47#	84-50	84-52	84-52#	84-54	84-54#	84-56	84-56#	84-80	84-80#	84-88	84-90	84-90#
	84-92	84-92#	85-16	85-16#	85-40	85-44	85-44#	86-16	86-16#	86-40	86-44	86-44#	87-16	87-16#
	87-43	87-58	87-79	87-102	87-102#	88-16	88-16#	88-42	88-42#	89-16	89-16#	89-42	89-42#	90-16
	90-16#	90-44	90-44#	91-16	91-16#	91-42	91-42#	93-18	93-18#	93-43	93-43#	94-16	94-16#	94-43
	94-43#	95-16	95-16#	95-43	95-43#	96-16	96-16#	96-46	96-46#	97-16	97-16#	97-45	97-45#	98-16
	98-16#	98-46	98-46#	99-16	99-16#	99-43	99-43#	100-18	100-18#	100-38	100-38#	100-39	100-39#	100-40
	100-40#	100-45	100-45#	100-52	100-52#	100-57	100-57#	100-61	100-61#	101-14	101-14#	101-36	101-36#	101-37
	101-37#	101-38	101-38#	101-46	101-46#	101-57	101-57#	102-14	102-14#	102-35	102-35#	102-36	102-36#	102-37
	102-37#	102-45	102-45#	102-57	102-57#									
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CROSS REFERENCE TABLE (CREF V01-05)

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	58-79#	58-82	58-82#	59-14	59-14#	59-16	59-16#	59-26	59-26#	59-26#	59-28	59-28#	59-31	59-31#
	59-33	59-33#	59-42	59-42#	59-46	59-46#	59-53	59-53#	59-53#	59-55	59-55#	59-58	59-58#	60-13
	60-13#	60-17	60-17#	60-18	60-18#	60-33	60-33#	60-33#	60-40	60-40#	60-40#	60-42	60-42#	60-44
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	64-83#	64-85	64-85#	64-90	64-90#	64-91	64-91#	64-107	64-107#	64-107#	64-117	64-117#	64-117#	64-124
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	64-199#	64-199#	64-205	64-205#	64-205#	64-208	64-208#	64-212	64-212#	65-16	65-16#	65-18	65-18#	65-24
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	65-130#	65-132	65-132#	65-140	65-140#	65-141	65-141#	65-142	65-142#	65-158	65-158#	65-158#	65-167	65-167#
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	69-135	69-135#	69-135#	69-136	69-136#	69-141	69-141#	69-141#	69-144	69-144#	69-147	69-147#	69-149	69-149#
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	70-158	70-158#	70-160	70-160#	70-161	70-161#	70-162	70-162#	70-164	70-164#	70-166	70-166#	72-26	72-26#
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	72-126	72-126#	72-128	72-128#	72-130	72-130#	72-140	72-140#	72-143	72-143#	72-144	72-144#	72-145	72-145#
	72-148	72-148#	73-18	73-18#	73-20	73-20#	73-41	73-41#	73-41#	73-43	73-43#	73-45	73-45#	73-47
	73-47#	73-65	73-65#	73-65#	73-67	73-67#	73-69	73-69#	74-16	74-16#	74-43	74-43#	75-15	75-15#
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	76-56	76-56#	77-18	77-18#	77-37	77-37#	77-43	77-43#	78-15	78-15#	78-44	78-44#	79-15	79-15#
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	84-88#	84-88#	84-90	84-90#	84-92	84-92#	85-16	85-16#	85-40	85-40#	85-40#	85-44	85-44#	86-16
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	87-79	87-79#	87-79#	87-102	87-102#	88-16	88-16#	88-42	88-42#	89-16	89-16#	89-42	89-42#	90-16
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	102-37#	102-45	102-45#	102-57	102-57#									
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            19-8    19-8    19-8    19-8    19-8    19-8    19-8#   27-46   27-46   27-46   27-46#  28-37   28-37   28-37
            28-37#  30-89   30-89   30-89   30-89#  30-93   30-93   30-93   30-93#  30-100  30-100  30-100  30-100# 31-48
            31-48   31-48   31-48#  31-55   31-55   31-55   31-55#  31-72   31-72   31-72   31-72#  32-35   32-35   32-35
            32-35#  53-56   53-56   53-56   53-56#  54-50   54-50   54-50   54-50#  54-71   54-71   54-71   54-71#  56-48
            56-48   56-48   56-48#  56-76   56-76   56-76   56-76#  56-104  56-104  56-104  56-104# 56-132  56-132  56-132
            56-132# 56-144  56-144  56-144  56-144# 58-32   58-32   58-32   58-32#  58-43   58-43   58-43   58-43#  58-66
            58-66   58-66   58-66#  58-74   58-74   58-74   58-74#  59-26   59-26   59-26   59-26#  59-53   59-53   59-53
            59-53#  60-33   60-33   60-33   60-33#  60-40   60-40   60-40   60-40#  62-41   62-41   62-41   62-41#  62-48
            62-48   62-48   62-48#  62-51   62-51   62-51   62-51#  63-44   63-44   63-44   63-44#  63-54   63-54   63-54
            63-54#  63-57   63-57   63-57   63-57#  64-54   64-54   64-54   64-54#  64-67   64-67   64-67   64-67#  64-72
            64-72   64-72   64-72#  64-77   64-77   64-77   64-77#  64-107  64-107  64-107  64-107# 64-117  64-117  64-117
            64-117# 64-124  64-124  64-124  64-124# 64-130  64-130  64-130  64-130# 64-138  64-138  64-138  64-138# 64-148
            64-148  64-148  64-148# 64-179  64-179  64-179  64-179# 64-192  64-192  64-192  64-192# 64-199  64-199  64-199
            64-199# 64-205  64-205  64-205  64-205# 65-42   65-42   65-42   65-42#  65-51   65-51   65-51   65-51#  65-57
            65-57   65-57   65-57#  65-61   65-61   65-61   65-61#  65-98   65-98   65-98   65-98#  65-107  65-107  65-107
            65-107# 65-114  65-114  65-114  65-114# 65-118  65-118  65-118  65-118# 65-158  65-158  65-158  65-158# 65-167
            65-167  65-167  65-167# 65-173  65-173  65-173  65-173# 65-179  65-179  65-179  65-179# 66-43   66-43   66-43
            66-43#  66-49   66-49   66-49   66-49#  68-45   68-45   68-45   68-45#  68-65   68-65   68-65   68-65#  69-26#
            69-50   69-50   69-50   69-50#  69-70   69-70   69-70   69-70#  69-90   69-90   69-90   69-90#  69-110  69-110
            69-110  69-110# 69-116  69-116  69-116  69-116# 69-135  69-135  69-135  69-135# 69-141  69-141  69-141  69-141#
            69-160  69-160  69-160  69-160# 69-167  69-167  69-167  69-167# 70-19#  70-50   70-50   70-50   70-50#  70-58
            70-58   70-58   70-58#  70-98   70-98   70-98   70-98#  70-106  70-106  70-106  70-106# 70-146  70-146  70-146
            70-146# 70-155  70-155  70-155  70-155# 72-71   72-71   72-71   72-71#  72-123  72-123  72-123  72-123# 73-41
            73-41   73-41   73-41#  73-65   73-65   73-65   73-65#  75-45   75-45   75-45   75-45#  76-46   76-46   76-46
            76-46#  81-41   81-41   81-41   81-41#  83-42   83-42   83-42   83-42#  84-50   84-50   84-50   84-50#  84-88
            84-88   84-88   84-88#  85-40   85-40   85-40   85-40#  86-40   86-40   86-40   86-40#  87-43   87-43   87-43
            87-43#  87-58   87-58   87-58   87-58#  87-79   87-79   87-79   87-79#  103-15  103-15# 103-16  103-16# 103-17
           103-17#  103-18  103-18# 103-41  103-41
MSXFER      1-282#  17-15#
MANUAL      1-:62#  17-15#
MEMORY      1-:66#  17-15#
OPEN        1-:71#  17-15#
POINTE      1-:76#  17-15#  17-34
POP        25-40#   27-51   44-46
PRINTB      1-<39#  17-15#  27-49   28-48   32-36   32-40   32-44   32-45   32-46   32-55   32-58   32-70   32-73   37-9
           37-16    37-18   37-19   37-23   37-24   37-29   37-30   37-31   37-36   37-37   37-38   37-42   37-43   37-44
           37-48    37-49   37-50   37-54   37-55   37-56   37-63   37-65   37-66   37-67   37-68   37-69   37-70   37-71
           37-72    37-73   37-74   37-75   37-7?   37-80   37-87   37-93   37-99   37-100  37-101  37-108  37-109  37-110
           37-111   37-112  37-116  37-117  37-118  37-121  37-128  37-130  37-134  40-57   40-86   69-111  69-136  69-161
           69-162   70-52   70-100  70-148  70-150
PRINTF      1-<79#  17-15#  51-11
PRINTS      1-=19#  17-15#
PRINTX      1-=59#  17-15#  33-33   34-37   53-42   53-59   56-145  101-46  102-45
PUSH       25-30#   27-34   44-37
READBU      1-=99#  17-15#
READEF      1->03#  17-15#  40-30   40-32   40-34   40-36
RFLAGS      1->08#  17-15#
SETPRI      1->13#  17-15#  30-56   40-10   60-18   60-42   63-25   63-60   64-38   64-91   64-163  65-26   65-63   65-82
           65-120   65-142  65-181  66-21   66-53   69-30   69-175  70-31   70-61   70-79   70-109  70-127  70-158  100-40
           101-38   102-37
SETVEC      1->18#  17-15#  30-54   30-55   41-10   53-22   60-17   63-23   63-24   64-37   64-90   64-162  65-24   65-25
           65-80    65-81   65-140  65-141  66-19   66-20   69-29   70-29   70-30   70-77   70-78   70-125  70-126  100-38
           100-39   101-36  101-37  102-35  102-36
SLASH       1->24#  17-15#
STARS       1->38#  17-15#
SVC         1->52#  17-14#  17-15
```

CROSS REFERENCE TABLE (CREF V01-05)

```
WAIT    25-52#  58-26   58-38   58-60   59-41   59-45   62-27   62-32   62-37
XFER     1-a12# 17-15#  69-26#  70-19#
XFERF    1-a16# 17-15#
XFERT    1-a20# 17-15#
```