DMR-11 DMR-11 FCTNL DIAG AH-F832C-MC NOV 1980
DMP-11 CZDMICO FICHE 1 OF 2

DMR-11 DMR-11 FCTNL DIAG AH-F832C-MC NOV 1980
DMP-11 CZDMICO FICHE 2 OF 2

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                                IDENTIFICATION
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                    PRODUCT CODE:   AC-F830C-MC

                    PPODUCT NAME:   CZDMICO  DMR-11 FCTNL DIAG

                    PRODUCT DATE:   AUGUST 1980

                    MAINTAINER:     DIAGNOSTIC ENGINEERING

                    AUTHOR:         MIKE O'CONNOR
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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 UNIBUS ADDRESS, VECTOR ADDRESSES AND TEST CONFIGURATION. 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.

THE FOLLOWING ARE THE REVISION LEVELS OF THIS DIAGNOSTIC:
REV A - INITIAL RELEASE
REV B - SUPPORT REMOTE LOOPBACK IN TESTS 17-19 PLUS BUG FIXES.
REV C - DETECT 1MSEC PROGRAM TIMER OUT OF RANGE IN TEST 10.

2.0 HARDWARE REQUIREMENTS

THE FOLLOWING HARDWARE IS REQUIRED TO RUN THE DMR-11 FUNCTIONAL DIAGNOSTIC TESTS:

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

3.0 PRELIMINARY PROGRAM REQUIREMENTS

IT IS ADVISED THAT THE STATIC DIAGNOSTICS BE RUN BEFORE THESE FUNCTIONAL DIAGNOSTICS. IT IS ASSUMED THAT THE PROCESSOR IS IN PROPER WORKING CONDITION.

ENSURE THAT THE SWITCH 1 AT LOCATION E-85 ON THE M8207 IS ON. IF THIS SWITCH IS OFF, THE MAINTENANCE BITS IN BSEL1 CAN'T BE USED AND CERTAIN TESTS WILL BE NOT BE CORRECTLY RUN.

WHEN CHOSING A CABLE TEST CONNECTION, ENSURE THAT THE SWITCH PACK E-39 ON THE M8203 IS PROPERLY SET UP FOR THE DESIRED INTERFACE.

IF CHOSING TEST CONFIGURATION OPTIONS 1-4, IT IS NOT NECESSARY TO SELECT THE INTERFACE; HOWEVER THE BAUD RATE MUST BE CORRECT. FOR EXAMPLE IF IT IS DESIRED TO RUN CONFIGURATION 3 (H3255-EIA), IT IS NOT NECESSARY TO HAVE SWITCH 7 OF THE SWITCH PACK IN THE OFF POSITION. IT IS, HOWEVER, NECESSARY TO HAVE THE BAUD RATE SELETCTED TO BE WITHIN THE EIA RANGE.

NOTE THAT A MANUFACTURING-ONLY PATCH IS REQUIRED TO RUN WHEN USING THE SPECIAL MANUFACTURING TEST CONNECTORS. THIS PATCH WILL CHANGE THE FLAG WORD 'MANUF' TO A NON-ZERO VALUE. WHEN THE FLAG IS NON-ZERO, THE MAINTENANCE BIT IS SET BY A MODEM WRITE COMMAND IF THE V.35 OR EIA ONBOARD CONNECTORS ARE USED.

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 DMR BAUD RATE. EXAMPLES OF EXECUTION TIME

11/70 WITH CACHE AND DMR AT 2.4K	4 AND 1/2 MINUTES
11/70 WITHOUT CACHE AND DMR AT 2.4K	5 AND 1/2 MINUTES
11/34 AND DMR AT 2.4K	10 MINUTES

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

IF MEMORY MANAGEMENT IS AVAILABLE, IT IS USED BY CERTAIN TESTS IN THIS FUNCTIONAL 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.

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 :

```
DPS 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) CONTAIN-
      ING THE ERROR
IER   INHIBIT ERROR REPORTING
IBE   INHIBIT BASIC ERROR REPORTS
IXE   INHIBIT EXTENDED ERROR REPORTS
PRI   DIRECT ALL MESSAGES TO A LINE PRINTER
PNT   PRINT NUMBER OF TEST BEING EXECUTED
BOE   BELL ON ERROR
UAM   RUN IN UNATTENDED MODE, BYPASSING MANUAL
      INTERVENTION TESTS
ISR   INHIBIT STATISTICAL REPORTS
IDU   INHIBIT DROPPING OF UNITS BY DIAGNOSTIC
LOT   LOOP ON TEST
```

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

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

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

6.3.1.5 EFFECT OF START COMMAND

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

THE HARDWARE PARAMETER DIALOGUE COMMENCES WITH THE QUESTION "# UNITS?" TO WHICH THE OPERATOR REPLIES WITH A DECIMAL NUMBER N FROM 1 TO 16. THE TERM "UNIT" REFERS TO THE DEVICE TO WHICH THIS SERIES OF DIAGNOSTICS IS DEDICATED. FOLLOWING THIS ARE THE QUESTIONS WHEREBY THE P-TABLES THEMSELVES WILL BE BUILT. EACH P-TABLE IS A CORE-RESIDENT TABLE CONTAINING ALL THE HARDWARE INFORMATION FOR ONE UNIT. THE OPERATOR MUST SUPPLY N (NUMBER OF UNITS) VALUES FOR EACH QUESTION. HE MAY DO THIS BY GIVING ONE ANSWER TO EACH QUESTION (IN WHICH CASE THE SERIES OF QUESTIONS WILL BE POSED N TIMES) OR BY GIVING N VALUES, SEPARATED BY COMMAS, TO EACH QUESTION (SERIES WILL BE POSED ONCE). EACH QUESTION IS FOLLOWED BY THE RESPONSE RADIX (D FOR DECIMAL, B FOR BINARY, O FOR

OCTAL, L FOR YES/NO) IN PARENTHESES AND THE DEFAULT VALUE AFTER THE PARENTHESES.

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

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

EXAMPLE:

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

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

6.3.2 RESTART COMMAND

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

6.3.2.1 TESTS, PASS, AND FLAGS SWITCHES

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

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

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

6.3.2.3 EFFECT OF RESTART COMMAND

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

6.3.3 CONTINUE COMMAND

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

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

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

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

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

6.3.3.3 EFFECT OF CONTINUE COMMAND

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

6.3.4 PROCEED COMMAND

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

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

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

6.3.4.2 EFFECT OF PROCEED COMMAND

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

6.3.5 ADD COMMAND

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

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

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

6.3.5.2 EFFECT OF ADD COMMAND

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

6.3.6 DROP COMMAND

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

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

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

6.3.6.2 EFFECT OF DROP COMMAND

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

6.3.7 PRINT COMMAND

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

6.3.7.1 EFFECT OF PRINT COMMAND

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

6.3.8 DISPLAY COMMAND

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

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

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

6.3.8.2 EFFECT OF DISPLAY COMMAND

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

6.3.9 FLAGS COMMAND

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

6.3.9.1 EFFECT OF FLAGS COMMAND

THE CURRENT SETTINGS OF ALL FLAGS ARE PRINTED.

6.3.10 ZFLAGS COMMAND

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

6.3.10.1 EFFECT OF ZFLAGS COMMAND

ALL FLAGS ARE CLEARED.

6.3.11 CONTROL CHARACTERS

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

A CONTROL Z (Z) ENTERED DURING ONE OF THE THREE OPERATOR

DIALOGUES- HARD CORE QUESTIONS (SEE 6.2),HARDWARE DIALOGUE (SEE 6.3.1.5), OR SOFTWARE DIALOGUE (SEE 6.3.1.5) CAUSES THE DEFAULTS TO BE TAKEN FOR THE REMAINDER OF THAT DIALOGUE.

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

6.3.12 HARDWARE PARAMETERS

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

1. CSR ADDRESS: (O) 160070?

THIS IS THE ADDRESS AT WHICH THE CSR REGISTERS (SELO) RESIDE ON THE UNIBUS. THE ALLOWABLE RANGE IS 160000-177776 (OCTAL), AND THE DEFAULT VALUE IS 160070.

2. VECTOR ADDRESS: (O) 300 ?

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

3. TEST CONFIGURATION -

```
      0 = INTERNAL (NO CONNECTOR)
      1 = H3254 - V.35        (NOTE:  MODE 1-4 ALLOWS
      2 = H3254 - INTEGRAL     PROGRAM INTERFACE SELECTION)
      3 = H3255 - RS232C/423
      4 = H3255 - RS422
      5 = CABLE AND SW PACK INTERFACE SELECTED
          (V.35-H3250, INTEGRAL-BC55A-10, RS232C-H325, RS423/422-H3251)
* SELECT THE FOLLOWING ONLY IF THE MODEM SUPPORTS LOOPBACK *
      6 = LOCAL LOOP
      7 = REMOTE LOOP
     (O)  5 ?
```

THIS QUESTION WILL COVER ALL THE POSSIBLE TEST CONFIGURATIONS. THE DEFAULT IS FOR ACTUAL CABLE LOOPBACK (5). CONFIGURATION 0 WILL ENABLE LINE UNIT (TTL) LOOPBACK. IF THIS IS SELECTED NO CABLES OR CONNECTORS SHOULD BE CONNECTED. CONFIGURATIONS 1-4 WILL SELECT THE INTERFACE REGARDLESS OF THE SWITCH SETTING AS LONG AS THE PROPER BAUD RATE IS SELECTED (I.E. EIA - 2.4K-19.2K).

6.3.13 SOFTWARE PARAMETERS

THE ONLY SOFTWARE PARAMETER QUESTION ASKED BY THE DIAGNOSITC CONCERNS A SOFTWARE TIMEOUT VARIABLE THAT IS USED TO PREVENT SOFTWARE "HUNG" CONDITIONS. THIS VARIABLE IS A VALUE FORM 1-5.

SELECTABLE PROGRAM LOOP TIME-OUT VARIABLE

[REFER TO LISTING 6.3.13] (MAX=5; MIN=1) (0) 5 ?

THERE ARE TWO FACTORS THAT SHOULD BE CONSIDERED WHEN ANSWERING THIS QUESTION. THE FIRST IS PROCESSOR SPEED; THE FASTER THE PROCESSOR THE HIGHER THE VARIABLE SHOULD BE. THE SECOND IS BAUD RATE; THE SLOWER THE DMR BAUD RATE THE HIGHER THE VARAIBLE SHOULD BE. FOR EXAMPLE:

11/70 WITH CACHE AND DMR AT 1 MEG.: 4
11/34 AND DMR AT 56K: 2
11/40 AND DMR AT 2.4K: 3

THE DEFAULT IS 5. THIS WILL COVER THE WORST CASE (I.E. 11/70 WITH CACHE AND THE DMR AT 2.4K).

6.3.14 EXTENDED DISCUSSION OF P-TABLE DIALOGUE

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

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

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

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

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

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

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

NOW LET US SEE HOW WE COULD USE THESE CAPABILITIES TO CONSTRUCT A SET OF P-TABLES. ASSUME THAT WE HAVE 16 UNITS,

AND THAT THERE ARE THREE HARDWARE PARAMETERS FOR EACH (THREE SLOTS IN THE P-TABLE, THREE HARDWARE QUESTIONS IN THE DIALOGUE). LET THE DESIRED VALUE FOR THE FIRST PARAMETER BE THE NUMBER 75 FOR ALL 16 TABLES. LET THE DESIRED VALUE FOR THE SECOND PARAMETER BE EQUAL TO THE UNIT NUMBER (0,1,2,...,15) EXCEPT FOR UNIT 12, WHICH SHOULD RECEIVE THE VALUE 11. LET THE DESIRED VALUE FOR THE THIRD PARAMETER BE THE NUMBER 76 FOR THE FIRST 7 UNITS AND THE NUMBER 77 FOR THE LAST 9 UNITS.

THE FOLLOWING DIALOGUE WOULD ACCOMPLISH THIS GOAL:

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

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

THE FIRST TIME THE SERIES IS ASKED, SLOT ONE RECEIVES A 75
IN ALL 16 TABLES. SLOT TWO RECEIVES THE VALUES 0,1,2,...,6
IN TABLES 0 THRU 6 AND A CONSTANT 6 IN TABLES 7 THRU 15.
SLOT THREE RECEIVES A CONSTANT 76 IN ALL 16 TABLES.

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

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

```
                                7.0 DEVICE INFORMATION TABLES

                                SEE THE GLOBAL EQUATES SECTION FOR DEVICE CSR BIT DEFINITIONS


                                8.0 TEST DESCRIPTIONS

                                ;*****************************************************************
                                ;*                TEST 1 - DMR-11
                                ;* VERIFY THAT ADDRESSING THE 4 UNIBUS CSRS DOES NOT CAUSE A NON-
                                ;* EXISTENT MEMORY TRAP.
                                ;*
                                ;* THE DMR IS AN NPR DEVICE RESIDING ON A UNIBUS.  COMMUNICATION
                                ;* BETWEEN THE MAIN CPU AND THE DMR IS ACCOMPLISHED THROUGH A
                                ;* SET OF FOUR 16-BIT UNIBUS CONTROL AND STATUS REGISTERS (CSRS).
                                ;* THE FOUR REGISTERS ARE ASSIGNED ADDRESSES IN THE I/O PAGE
                                ;* FLOATING ADDRESS SPACE: 76XXX0 - 76XXX6
                                ;*
                                ;* NOTE: THIS TEST IS REDUNDANT IN THAT STATIC LOGIC TESTS SHOULD
                                ;* HAVE BEEN RUN BEFORE THESE FREE-RUNNING TESTS WERE STARTED, AND
                                ;* THEY SHOULD HAVE DETECTED ANY CSR ADDRESSING PROBLEMS.
                                ;* BUT JUST IN CASE THOSE STATIC TESTS AREN'T RUN, WE'LL BE SAFE.
                                ;*****************************************************************


                                ;*****************************************************************
                                ;*                TEST 2 - DMR-11
                                ;* ROM CRC/CCITT - CHECK ROM POSITION AND CALCULATE CRC/CCITT.  THE
                                ;* LAST 4 BYTES CONTAIN INFORMATION ABOUT THE ROM TO CHECK.  THE 1ST
                                ;* OF THESE BYTES CONTAINS THE ASCII VERSION NUMBER.  THE 2ND BYTE
                                ;* CONTAINS THE ROM NUMBER.  THE 3RD AND 4TH BYTES CONTAIN A NEGATIVE
                                ;* CRC/CCITT WORD FOR THE ROM.
                                ;*                        CHIP ADDRESS RANGE
                                ;*    LOCATION  CHIP NO.        BYTE     ADDRESS RANGE
                                ;*      E03        0            LOW      0000 - 1777
                                ;*      E02        1            HIGH     0000 - 1777
                                ;*      E04        2            LOW      2000 - 3777
                                ;*      E01        3            HIGH     2000 - 3777
                                ;*      E05        4            LOW      4000 - 5777
                                ;*      E14        5            HIGH     4000 - 5777
                                ;*
                                ;*************** IMPORTANT !!!!!!!!!! ******************************
                                ;* FOR THIS TEST TO RUN CORRECTLY, ENSURE THAT SWITCH 1 AT LOCATION
                                ;* E85 ON THE M8207 IS ON.  IF THIS SWITCH IS OFF, BSEL1 WILL BE
                                ;* LOCKED OUT AND THE MAINTENANCE FEATURES WILL NOT BE ENABLED.
                                ;*****************************************************************
                                ;*
                                ;*      SUBTEST 1 - ON THE FIRST PASS PRINT THE VERSION # IN EACH ROM
                                ;*      SUBTEST 2 - GENERATE THE CRC-CCITT IN EACH ROM AND COMPARE IT
                                ;*                  IT AGAINST THE CRC BLASTED IN THE ROM
                                ;*      SUBTEST 3 - COMPARE THE ROM # BLASTED IN THE ROM AGAINST THE
                                ;*                  EXPECTED ROM #.
                                ;*****************************************************************
```

```
;*****************************************************************
;*                TEST 3 - DMR-11
;* MASTER CLEAR
;* THIS TEST WILL ISSUE 2 MASTER CLEARS.  EACH CALL TO THE MASTER
;* CLEAR ROUTINE WILL ENSURE THAT THE RUN BIT WILL BE SET.  ALSO
;* THE MASTER CLEAR WILL CAUSE THE DIAGNOSTIC MICROTESTS TO BE
;* RUN WHEN THE MICRODIAGNOSTIC BIT (BIT 13 IN SEL0) IS CORRECTLY
;* SET OR CLEARED.  BECAUSE THE RUNNING OF MICROTESTS DEPENDS ON THE
;* EXCLUSIVE OR OF THE  HARDWARE SWITCH 10 ON E134 OF THE M8203 AND
;* THE MICRODIAGNOSTIC BIT, WE CAN'T KNOW WHETHER THE SETTING OR
;* CLEARING OF BIT 13 WILL RESULT IN THE RUNNING OF MICROTESTS.
;* THEREFORE THE MASTER CLEAR SUBROUTINE WILL TOGGLE (I.E. SET
;* BIT 13 ONLY ON EVERY OTHER MASTER CLEAR) THE SOFTWARE BIT.
;* THIS WILL ENSURE THAT RFGARDLESS OF THE POSITION OF THE
;* HARDWARE SWITCH, MICROTESTS WILL BE RUN EVERY OTHER MASTER CLEAR.
;* WHEN RUNNING THIS TEST, WE EXPECT TO ADD THE RESULTS OF BSEL3
;* AFTER EACH MASTER CLEAR.
;* BSEL3 = 100          -  MICROTESTS DISABLED
;* BSEL3 = 200          -  MICROTESTS RUN SUCCESFULLY
;* IF THE RESULT OF THE 2 MASTER CLEARS IS NOT 300, AN ERROR IS
;* REPORTED.
;*
;* ADDITIONALLY THIS ROUTINE WILL REPORT WHENEVER THE RESULT OF
;* BSEL3 IS 0.  THIS WILL MEAN THAT THE DEVICE IS NOT A DMR
;* (I.E. DMC)
;*****************************************************************



;*****************************************************************
;*                TEST 4 - DMR-11
;*  BASE IN COMMANDS
;*
;*  SUBTEST 1  - ISSUE A BASE IN  -  DMR MODE.
;*               ENSURE THAT THE DMR MODE BIT (BIT 4) IS SET IN
;*               THE MICROCODE SCRATCH PAD 7 AND THAT THE DDCMP
;*               MESSAGE VARIABLES ARE PROPERLY INITIALIZED.
;*  SUBTEST 2  - ISSUE A BASE IN  -  DMC MODE.
;*               ENSURE THAT THE DMC MODE BIT (BIT 4) IS CLEAR IN
;*               THE MICROCODE SCRATCH PAD 7 AND THAT THE DDCMP
;*               MESSAGE VARIABLES ARE PROPERLY INITIALIZED.
;*
;*****************************************************************
```

```
                                ;*****************************************************************
                                ;*              TEST 5 - DMR-11
                                ;* DMR COMMANDS
                                ;*  SUBTEST 1  - ISSUE AN ENABLE EXTENDED ERROR COMMAND AND CHECK THAT
                                ;*               THE EXT. ENABLE BIT IS SET IS SCRATCH PAD 13.  THEN
                                ;*               DISABLE EXTENDED ERROR AND CHECK THAT THE ENABLE BIT
                                ;*               IS CLEAR.
                                ;*  SUBTEST 2  - SET REP/SEL TIMER VALUE AND SET THE DMR THRESHOLD
                                ;*               VALUES.  CHECK THAT THE VALUES ARE CORRECT IN
                                ;*               THE BASE TABLE AFTER HALTING THE DMR.
                                ;*
                                ;*
                                ;*****************************************************************



                                ;*****************************************************************
                                ;*              TEST 6 - DMR-11
                                ;*  CONTROL IN COMMAND TEST -
                                ;*  SUBTEST 1  - CONTROL IN, FULL DUPLEX, DDCMP MODE.  ENSURE THAT
                                ;*               THE HALF-DUPLEX BIT IS CLEAR IN THE MODEM STATUS WORD,
                                ;*               ALSO ENSURE THAT DDCMP MODE BIT IS SET IN SCRATCH PAD 7.
                                ;*  SUBTEST 2  - CONTROL IN, HALF DUPLEX.  ENSURE THAT THE HALF DUPLEX
                                ;*               BIT IS SET.
                                ;*  SUBTEST 3  - CONTROL IN, MAINTENANCE MODE.  ENSURE THAT MAINT. MODE
                                ;*               BIT IS SET IN SCRATCH PAD 7.
                                ;*  SUBTEST 4  - CONTROL IN USING SELECTED LOOPBACK.  ISSUE A CONTROL IN
                                ;*               USING THE USER SELECTED LOOPBACK.  IF THE LOOPBACK IS
                                ;*               NOT CORRECT, DMR RUN MODE ACKNOWLEDGE WILL NOT BE
                                ;*               RECEIVED.
                                ;*
                                ;*
                                ;*****************************************************************



                                ;*****************************************************************
                                ;*              TEST 7 - DMR-11
                                ;* MODEM WRITE COMMAND
                                ;*  SUBTEST 1  - WRITE DATA PATTERNS INTO THE MODEM WRITE REGISTER.
                                ;*               ENSURE THAT ON THE NEXT MODEM READ THAT THE
                                ;*               MICROCODE RETURNS THE PATTERN WRITTEN INTO BSEL6.
                                ;*  SUBTEST 2  - ATTEMPT TO WRITE BOTH THE HALF-DUPLEX BIT AND THE
                                ;*               RTS HOLD BIT.  THE MICROCODE SHOULD NOT ALLOW THIS
                                ;*               TO HAPPEN.  WHEN READING THE MODEM STATUS, ONLY
                                ;*               THE HALF-DUPLEX SHOULD BE SET.
                                ;*
                                ;*****************************************************************
```

```
;*****************************************************************
;*                TEST 8 - DMR-11
;*  SUBTEST 1  - TRANSMIT A BUFFER THREE TIMES WIHOUT ASSIGNING A
;*               RECEIVE BUFFER.  BY ASSIGNING A NO BUFFER THRESHOLD
;*               OF THREE, ENSURE THAT A NO BUFFER ERROR IS RECEIVED
;*               AFTER THE THIRD THRANSMISSION.
;*  SUBTEST 2  - TRANSMIT A BUFFER WITHOUT A RECEIVE BUFFER.
;*               ASSIGN THE NAKS THRESHOLD OF 3 AND A NO BUFFER
;*               THRESHOLD OF 7.  CHECK THAT THE NAKS ERROR COUNT IS
;*               THREE AFTER SHUTDOWN.
;*****************************************************************



;*****************************************************************
;*                TEST 9 - DMR-11
;* NON-EXISTENT MEMORY (NXM) ERROR CHECK
;* PERFORM DMR COMMANDS USING NXM ADDRESSES; VERIFY THAT NXM ERROR IS
;* REPORTED IN EACH OF THE FOLLOWING SUBTESTS:
;*  SUBTEST 1  -  BASE IN RESUME COMMAND - BASE TABLE ADDRESS IS NXM
;*  SUBTEST 2  -  BA/CC IN RECEIVE COMMAND - BA/CC IN ADDRESS IS NXM
;*  SUBTEST 3  -  BA/CC IN TRANSMIT COMMAND - BA/CC IN ADDRESS IS NXM
;*
;*****************************************************************



;*****************************************************************
;*                TEST  10 - DMR-11
;* TIME OUT - FORCE A TIMEOUT AND VERIFY THAT THE ERROR IS REPORTED.
;* THIS TEST WILL ALSO USE AN APPROXIMATE TIMER TO DETERMINE IF THE
;* M8207 1 MSEC. PROGRAM TIMER IS OUT OF RANGE.
;*
;*****************************************************************



;*****************************************************************
;*                TEST 11 - DMR-11
;*  MESSAGE TOO LONG - TRANSMIT A MESSAGE THAT IS TOO LONG FOR THE
;*  RECEIVE BUFFER AND VERIFY THAT THE "TOO LONG" ERROR IS RECEIVED.
;*
;*****************************************************************
```

```
;*****************************************************************
;*                TEST 12 - DMR-11
;*  PROCEDURE ERRORS -
;*  THE FOLLOWING SHOULD CAUSE THE DMR-11 TO HALT AND RESPOND WITH
;*  A PROCEDURE ERROR:
;*  SUBTEST 1  -  A SECOND BASE IN COMMAND
;*  SUBTEST 2  -  A CONTROL IN BEFORE A BASE IN
;*  SUBTEST 3  -  A BA/CC IN BEFORE A BASE IN
;*  SUBTEST 4  -  A BA/CC IN RCV WITH A BUFFER LENGTH OF 0
;*  SUBTEST 5  -  A BA/CC IN XMIT. WITH A BUFFER LENGTH OF 0
;*
;*****************************************************************



;*****************************************************************
;*                TEST 13 - DMR-11
;* FREE RUNNING FLAG MODE DATA TEST
;* TRANSMIT A MESSAGE AND VERIFY THE RECEIVED DATA IS CORRECT.
;* IN THIS TEST NO INTERRUPTS ARE USED AND THE LINE UNIT IS IN
;* INTERNAL (TTL) LOOPBACK.  THIS TEST IS THE FIRST TEST IN WHICH
;* THE DMR IS USED IN A DATA TRANSMISSION MODE.
;*****************************************************************



;*****************************************************************
;*                TEST  14 - DMR-11
;* IN THIS TEST - SEE IF WE HAVE MEMORY MANAGEMENT, IF SO SEE IF WE
;* HAVE THE MEMORY TO CHECK BITS 16 & 17 IN SEL6.  THIS WILL ALLOW
;* US TO TRANSFER DATA USING THOSE EXTENDED ADDRESSING BITS. AS IN
;* TEST 13 THE TEST IS NON-INTERRUPT AND INTERNAL (TTL) LOOPBACK IS
;* USED.
;*
;*****************************************************************
```

```
                                        ;*****************************************************************
                                        ;*                TEST 15 - DMR-11
                                        ;* RESUME BASE IN - DMC MODE
                                        ;* **  WILL NOT RUN IF MODEM LOOPBACK IS SELECTED  **
                                        ;* IN THIS TEST THE DMR WILL TRANSMIT AND RECEIVE 7 BUFFERS. DURING THE
                                        ;* TEST THE DMR WILL BE HALTED AND RESTARTED BY A BASE-IN RESUME IN THE
                                        ;* FOLLOWING MANNER:
                                        ;*      BASE IN
                                        ;*      CONTROL IN
                                        ;*      HALT    -       BASE IN RESUME
                                        ;*      2 BA/CC IN RECEIVE
                                        ;*      HALT    -       BASE IN RESUME
                                        ;*      2 BA/CC IN RECEIVE
                                        ;*      HALT    -       BASE IN RESUME
                                        ;*      2 BA/CC IN RECEIVE
                                        ;*      HALT    -       BASE IN RESUME
                                        ;*      1 BA/CC IN RECEIVE
                                        ;*      HALT    -       BASE IN RESUME
                                        ;*      2 BA/CC IN TRANSMIT
                                        ;*      HALT    -       BASE IN RESUME
                                        ;*      2 BA/CC IN TRANSMIT
                                        ;*      HALT    -       BASE IN RESUME
                                        ;*      2 BA/CC IN TRANSMIT
                                        ;*      HALT    -       BASE IN RESUME
                                        ;*      1 BA/CC IN TRANSMIT
                                        ;*      HALT    -       BASE IN RESUME
                                        ;*
                                        ;*      ALL BA/CC OUTS RECEIVES AND TRANSMITS WILL BE ACCOUNTED FOR AND
                                        ;*      THE CHARACTER COUNTS AND BUFFER ADDRESSES WILL BE CHECKED AGAINST
                                        ;*      THE RECEIVE/TRANSMIT TABLE.
                                        ;*
                                        ;*      THE BUFFERS ARE DETERMINED IN THE SUBROUTINE $BUFFS.  THIS
                                        ;*      SUBROUTINE WILL DETERMINE THE ADDRESS AND CHARACTER COUNT OF
                                        ;*      SEVEN RECEIVE AND SEVEN TRANSMIT BUFFERS.  THE ROUTINE WILL
                                        ;*      ATTEMPT TO USE AS LARGE BUFFERS AS POSSIBLE IN THE FOLLOWING
                                        ;*      HIERARCHY:
                                        ;*              A. IF THERE IS MEMORY MANAGEMENT, USE A PAGE ABOVE 32K.
                                        ;*              B. IF THERE IS FREE MEMORY ABOVE THE SUPERVISOR GREATER
                                        ;*                 THAN 2K BYTES, USE THAT MEMORY
                                        ;*              C. IF NEITHER OF THE PRECEEDING TWO ARE POSSIBLE, USE
                                        ;*                 THE 2K BYTE DEFAULT BUFFER WITHIN THIS DIAGNOSTIC.
                                        ;*
                                        ;*****************************************************************
```

```
                                ;*****************************************************************
                                ;*              TEST 16 - DMR-11
                                ;* RESUME BASE IN - DMR MODE
                                ;* IN THIS TEST THE DMR WILL TRANSMIT AND RECEIVE 7 BUFFERS. DURING THE
                                ;* TEST THE DMR WILL BE HALTED AND RESTARTED BY A BASE-IN RESUME IN THE
                                ;* FOLLOWING MANNER:
                                ;*      BASE IN
                                ;*      CONTROL IN
                                ;*      HALT    -       BASE IN RESUME
                                ;*      2 BA/CC IN RECEIVE
                                ;*      HALT    -       BASE IN RESUME
                                ;*      2 BA/CC IN RECEIVE
                                ;*      HALT    -       BASE IN RESUME
                                ;*      2 BA/CC IN RECEIVE
                                ;*      HALT    -       BASE IN RESUME
                                ;*      1 BA/CC IN RECEIVE
                                ;*      HALT    -       BASE IN RESUME
                                ;*      2 BA/CC IN TRANSMIT
                                ;*      HALT    -       BASE IN RESUME
                                ;*      2 BA/CC IN TRANSMIT
                                ;*      HALT    -       BASE IN RESUME
                                ;*      2 BA/CC IN TRANSMIT
                                ;*      HALT    -       BASE IN RESUME
                                ;*      1 BA/CC IN TRANSMIT
                                ;*      HALT    -       BASE IN RESUME
                                ;*
                                ;*      ALL BA/CC OUTS RECEIVES AND TRANSMITS WILL BE ACCOUNTED FOR AND
                                ;*      THE CHARACTER COUNTS AND BUFFER ADDRESSES WILL BE CHECKED AGAINST
                                ;*      THE RECEIVE/TRANSMIT TABLE.
                                ;*
                                ;*      THE BUFFERS ARE DETERMINED IN THE SUBROUTINE $BUFFS.  THIS
                                ;*      SUBROUTINE WILL DETERMINE THE ADDRESS AND CHARACTER COUNT OF
                                ;*      SEVEN RECEIVE AND SEVEN TRANSMIT BUFFERS.  THE ROUTINE WILL
                                ;*      ATTEMPT TO USE AS LARGE BUFFERS AS POSSIBLE IN THE FOLLOWING
                                ;*      HIERARCHY:
                                ;*              A. IF THERE IS MEMORY MANAGEMENT, USE A PAGE ABOVE 32K.
                                ;*              B. IF THERE IS FREE MEMORY ABOVE THE SUPERVISOR GREATER
                                ;*                 THAN 2K BYTES, USE THAT MEMORY
                                ;*              C. IF NEITHER OF THE PRECEEDING TWO ARE POSSIBLE, USE
                                ;*                 THE 2K BYTE DEFAULT BUFFER WITHIN THIS DIAGNOSTIC.
                                ;*
                                ;*
                                ;*****************************************************************
```

```
;*****************************************************************
;*              TEST 17 - DMR-11
;* INTERRUPT DRIVEN EXERCISE
;* IN THIS TEST 64 BUFFERS WILL BE TRANSMITTED AND RECEIVED
;*
;* ALL BA/CC OUTS RECEIVES AND TRANSMITS WILL BE ACCOUNTED FOR AND
;* THE CHARACTER COUNTS AND BUFFER ADDRESSES WILL BE CHECKED AGAINST
;* THE RECEIVE/TRANSMIT TABLE.
;*
;*      THE BUFFERS ARE DETERMINED IN THE SUBROUTINE $BUFFS.  THIS
;*      SUBROUTINE WILL DETERMINE THE ADDRESS AND CHARACTER COUNT OF
;*      64 RECEIVE AND 64 TRANSMIT BUFFERS.  THE ROUTINE WILL
;*      ATTEMPT TO USE AS LARGE BUFFERS AS POSSIBLE IN THE FOLLOWING
;*      HIERARCHY:
;*              A. IF THERE IS MEMORY MANAGEMENT, USE A PAGE ABOVE 32K.
;*              B. IF THERE IS FREE MEMORY ABOVE THE SUPERVISOR GREATER
;*                 THAN 2K BYTES, USE THAT MEMORY
;*              C. IF NEITHER OF THE PRECEEDING TWO ARE POSSIBLE, USE
;*                 THE 2K BYTE DEFAULT BUFFER WITHIN THIS DIAGNOSTIC.
;*
;*****************************************************************


;*****************************************************************
;*              TEST  18 - DMR-11
;* LARGE MESSAGE
;* IN THIS MODE TRANSMIT AND RECEIVE 1 LARGE BUFFER
;*
;* THE BA/CC OUT RECEIVE AND TRANSMIT WILL BE ACCOUNTED FOR AND
;* THE CHARACTER COUNTS AND BUFFER ADDRESSES WILL BE CHECKED AGAINST
;* THE RECEIVE/TRANSMIT TABLE.
;*
;*      THE BUFFERS ARE DETERMINED IN THE SUBROUTINE $BUFFS.  THIS
;*      SUBROUTINE WILL DETERMINE THE ADDRESS AND CHARACTER COUNT OF
;*      ONE RECEIVE AND ONE TRANSMIT BUFFER.  THE ROUTINE WILL
;*      ATTEMPT TO USE AS LARGE BUFFERS AS POSSIBLE IN THE FOLLOWING
;*      HIERARCHY:
;*              A. IF THERE IS MEMORY MANAGEMENT, USE A PAGE ABOVE 32K.
;*              B. IF THERE IS FREE MEMORY ABOVE THE SUPERVISOR GREATER
;*                 THAN 2K BYTES, USE THAT MEMORY
;*              C. IF NEITHER OF THE PRECEEDING TWO ARE POSSIBLE, USE
;*                 THE 2K BYTE DEFAULT BUFFER WITHIN THIS DIAGNOSTIC.
;*
;*****************************************************************
```

```
;*****************************************************************
;*                TEST 19 - DMR-11
;* MAINTENANCE MODE OPERATION
;*
;* THE BA/CC OUT RECEIVE AND TRANSMIT WILL BE ACCOUNTED FOR AND
;* THE CHARACTER COUNTS AND BUFFER ADDRESSES WILL BE CHECKED AGAINST
;* THE RECEIVE/TRANSMIT TABLE.
;*
;*      THE BUFFERS ARE DETERMINED IN THE SUBROUTINE $BUFFS.  THIS
;*      SUBROUTINE WILL DETERMINE THE ADDRESS AND CHARACTER COUNT OF
;*      ONE RECEIVE AND ONE TRANSMIT BUFFER.  THE ROUTINE WILL
;*      ATTEMPT TO USE AS LARGE BUFFERS AS POSSIBLE IN THE FOLLOWING
;*      HIERARCHY:
;*              A. IF THERE IS MEMORY MANAGEMENT, USE A PAGE ABOVE 32K.
;*              B. IF THERE IS FREE MEMORY ABOVE THE SUPERVISOR GREATER
;*                 THAN 2K BYTES, USE THAT MEMORY
;*              C. IF NEITHER OF THE PRECEEDING TWO ARE POSSIBLE, USE
;*                 THE 2K BYTE DEFAULT BUFFER WITHIN THIS DIAGNOSTIC.
;*
;*****************************************************************
```

9.0 ERROR INFORMATION

9.1 ERROR REPORTING

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

THE FOLLOWING EXAMPLE PROVIDES A TYPICAL ERROR REPORT, WHICH DESCRIBES AN "IRDY NOT SET" ERROR, AND PROVIDES THE PC OF THE ERROR CALL AND THE PC OF THE CALL TO THE SUBROUTINE REPORTING IT, THE FAILING REGISTER NAME, AND DEVICE REGISTER CONTENTS :

```
CZDMR DVC FTL ERR 00002 ON UNIT 00 TST 006 SUB 000 PC:  016210
TIME OUT
ERROR IN SUBROUTINE CALLED AT PC: 036174
BUFFER STATUS
# OF BUFFERS: 7
BUFFER SIZE: 2048
IN  - RCV ASSIGNED:  7      XMIT ASSIGNED:  7
OUT - RCV RETURNED:  0      XMIT RETURNED:  0
DMR RUN ACKNOWLEDGE NOT RCVD
(CHECK INTERFACE, BAUD AND TURNAROUND)
```

ALL THE MESSAGES IN THE DIAGNOSTIC USE BASIC MESSAGE CALLS. THEREFORE THE INHIBIT EXTENDED ERROR FLAG WILL HAVE NO EFFECT ON THE MESSAGE OUTPUT. THE INHIBIT BASIC MESSAGES WILL INHIBIT THE ERROR MESSAGES.

@

```
        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 BGNSW,BGNDU,BGNSFT
```

```
                                .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 CZDMI,C,0,600.,0
002000                                                          L$NAME::
002000          103                                                     .ASCII /C/
002001          132                                                     .ASCII /Z/
002002          104                                                     .ASCII /D/
002003          115                                                     .ASCII /M/
002004          111                                                     .ASCII /I/
002005          000                                                     .BYTE   0
002006          000                                                     .BYTE   0
002007          000                                                     .BYTE   0
002010                                                          L$REV::
002010          103                                                     .ASCII  /C/
002011                                                          L$DEPO::
002011          060                                                     .ASCII  /0/
002012                                                          L$UNIT::
002012       000000                                                     .WORD   0
002014                                                          L$TIML::
002014       001130                                                     .WORD   600.
002016                                                          L$HPCP::
002016       036670                                                     .WORD   L$HARD
002020                                                          L$SPCP::
002020       037624                                                     .WORD   L$SOFT
002022                                                          L$HPTP::
002022       002174                                                     .WORD   L$HW
002024                                                          L$SPTP::
002024       002224                                                     .WORD   L$SW
002026                                                          L$LADP::
002026       040100                                                     .WORD   L$LAST
002030                                                          L$STA::
002030       000000                                                     .WORD   0
002032                                                          L$CO::
002032       000000                                                     .WORD   0
002034                                                          L$DTYP::
002034       000000                                                     .WORD   0
002036                                                          L$APT::
002036       000000                                                     .WORD   0
002040                                                          L$DTP::
002040       002124                                                     .WORD   L$DISPATCH
002042                                                          L$PRIO::
002042       000000                                                     .WORD   0
002044                                                          L$ENVI::
002044       000000                                                     .WORD   0
002046                                                          L$EXP1::
002046       000000                                                     .WORD   0
002050                                                          L$MREV::
002050          003                                                     .BYTE   C$REVISION
002051          003                                                     .BYTE   C$EDIT
```

```
002052                                                          L$EF::
002052  000000                                                          .WORD   0
002054  000000                                                          .WORD   0
002056                                                          L$SPC::
002056  000000                                                          .WORD   0
002060                                                          L$DEVP::
002060  010236                                                          .WORD   L$DVTYP
002062                                                          L$REPP::
002062  000000                                                          .WORD   0
002064                                                          L$EXP4::
002064  000000                                                          .WORD   0
002066                                                          L$EXP5::
002066  000000                                                          .WORD   0
002070                                                          L$AUT::
002070  000000                                                          .WORD   0
002072                                                          L$DUT::
002072  023602                                                          .WORD   L$DU
002074                                                          L$LUN::
002074  000000                                                          .WORD   0
002076                                                          L$DESP::
002076  010244                                                          .WORD   L$DESC
002100                                                          L$LOAD::
002100  104035                                                          EMT     E$LOAD
002102                                                          L$ETP::
002102  000000                                                          .WORD   0
002104                                                          L$ICP::
002104  020440                                                          .WORD   L$INIT
002106                                                          L$CCP::
002106  022034                                                          .WORD   L$CLEAN
002110                                                          L$ACP::
002110  021744                                                          .WORD   L$AUTO
002112                                                          L$PRT::
002112  020432                                                          .WORD   L$PROT
002114                                                          L$TEST::
002114  000000                                                          .WORD   0
002116                                                          L$DLY::
002116  000000                                                          .WORD   0
002120                                                          L$HIME::
002120  000000                                                          .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 19
 002122  000023                                                                                  .WORD   19
 002124                                                                                 L$DISPATCH::
 002124  023662                                                                                  .WORD   T1
 002126  024172                                                                                  .WORD   T2
 002130  025506                                                                                  .WORD   T3
 002132  025640                                                                                  .WORD   T4
 002134  026666                                                                                  .WORD   T5
 002136  030100                                                                                  .WORD   T6
 002140  030660                                                                                  .WORD   T7
 002142  031302                                                                                  .WORD   T8
 002144  032004                                                                                  .WORD   T9
 002146  032516                                                                                  .WORD   T10
 002150  032742                                                                                  .WORD   T11
 002152  033122                                                                                  .WORD   T12
 002154  034026                                                                                  .WORD   T13
 002156  034556                                                                                  .WORD   T14
 002160  036322                                                                                  .WORD   T15
 002162  036426                                                                                  .WORD   T16
 002164  036474                                                                                  .WORD   T17
 002166  036544                                                                                  .WORD   T18
 002170  036614                                                                                  .WORD   T19
```

```
                                .SBTTL  DEFAULT HARDWARE P-TABLE

                                ;////////////////////////////////////////////////////////////////////////
                                ;/ THE DEFAULT HARDWARE P-TABLE CONTAINS DEFAULT VALUES OF
                                ;/ THE TEST-DEVICE PARAMETERS.  **NOTE - MANY OF THE P-TABLE VALUES LISTED
                                ;/ BELOW ARE NOT USED IN THIS DIAGNOSTIC BUT ARE INCLUDED TO AGREE WITH
                                ;/ M8207 & M8203 DIAGNOSTIC P-TABLES.
                                ;////////////////////////////////////////////////////////////////////////

002172                                  BGNHW   DFPTBL
002172  000013                                                                          .WORD   L10000-L$HW/2
002174                                                                          L$HW::
002174                                                                          DFPTBL::

002174  000000                          .WORD        0          ;**NOT USED - MICROPROCESSOR TYPE
002176  160070                          .WORD   160070          ;DMR11 CSR UNIBUS ADDRESS DEFAULT
002200  000300                          .WORD      300          ;DMR11 INTERRUPT VECTOR DEFAULT
002202  000000                          .WORD        0          ;**NOT USED - PRIORITY LEVEL
002204  000000                          .WORD        0          ;**NOT USED - LINE UNIT
002206  000000                          .WORD      000          ;**NOT USED - SWITCH PACK #1 (REG 11)
002210  000000                          .WOPD      000          ;**NOT USED - SWITCH PACK #2 (REG 15)
002212  000000                          .WORD      000          ;**NOT USED - SWITCH PACK #3 (REG 16)
002214  000005                          .WORD        5          ;CABLE TURNAROUND (DEFAULT = CABLE(5))
002216  000000                          .WORD        0          ;**NOT USED - BAUD RATE
002220  000000                          .WORD        0          ;**NOT USED - RUN SWITCH

002222                                  ENDHW
002222                                                          L10000:
```

```
                                .SBTTL  DEFAULT SOFTWARE P-TABLE

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

 002222                                 BGNSW   SFPTBL
 002222  000001                                                                         .WORD   L10001-L$SW/2
 002224                                                                         L$SW::
 002224                                                                         SFPTBL::

 002224  000005                         SPEED:  .WORD   5       ;PROCESSOR SPEED VARIABLE USED
                                                                ;TO ALTER THE WAIT VARIABLES.
 002226                                 ENDSW
 002226                                                                         L10001:
```

```
                                .SBTTL  GLOBAL EQUATES SECTION

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

 002226                                 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.S ART==      32.                     ; START COMMAND WAS ISSUED
        000037                  EF.RESTART==    31.                     ; RESTART COMMAND WAS ISSUED
        000036                  EF.CONTINUE==   30.                     ; CONTINUE COMMAND WAS ISSUED
        000035                  EF.NEW==        29.                     ; A NEW PASS HAS BEEN STARTED
        000034                  EF.PWR==        28.                     ; A POWER-FAIL/POWER-UP OCCURRED
                                ;
                                ;
                                ; PRIORITY LEVEL DEFINITIONS
                                ;
        000340                  PRI07== 340
        000300                  PRI06== 300
        000240                  PRI05== 240
        000200                  PRI04== 200
        000140                  PRI03== 140
        000100                  PRI02== 100
```

```
000040                  PRIO1== 40
000000                  PRIO0== 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
                        ;;*****************************************************************

                        ;;*****************************************************************
                        ;SWITCH REGISTER OPTIONS

100000                  SW15=  100000
040000                  SW14=  40000
020000                  SW13=  20000
010000                  SW12=  10000
004000                  SW11=  4000
002000                  SW10=  2000
001000                  SW09=  1000
000400                  SW08=  400
000200                  SW07=  200
000100                  SW06=  100
000040                  SW05=  40
000020                  SW04=  20
000010                  SW03=  10
000004                  SW02=  4
000002                  SW01=  2
000001                  SW00=  1

                        ;;*****************************************************************
                        ;;CSR AND STAUS WORD DEFINITIONS
                        ;;SEL0 (CSR) - BSEL0/BSEL1
100000                  RUN=    BIT15          ;SET IF RUNNING
040000                  MCLR=   BIT14          ;MASTER CLEAR OF PROCESSOR AND LINE UNIT
020000                  MDIAG=  BIT13          ;CSR MAINTENANCE - ENABLE MICRODIAGNOSTICS
010000                  STLU=   BIT12          ;CSR MAINTENANCE - STEP LINE UNIT
004000                  LPLU=   BIT11          ;CSR MAINTENANCE - LINE UNIT LOOP
002000                  ROMO=   BIT10          ;CSR MAINTENANCE
001000                  ROMI=   BIT9           ;CSR MAINTENANCE
000400                  STUP=   BIT8           ;CSR MAINTENANCE - USED WITH LOOP LU
                                               ;WHEN ASSERTED, XMITTER SHIFTS; CLEAR, REC. SHIFTS
000200                  RDI=    BIT7           ;CSR - DMR11 READY RESPONSE
000100                  IESET=  BIT6           ;CSR - INTERRUPT ENABLE INPUT - DMR11 INTERRUPTS
                                               ;CPU WHEN RDI SET IN RESPONSE TO RQI BEING SET.
000040                  RQI=    BIT5           ;CSR - REQUEST IN
```

```
000020                  IECLR=  BIT4            ;CSR - INTERRUPT ENABLE INPUT - DMR11 INTERRUPTS
                                                ;CPU WHEN RDI CLEARS IN RESPONSE TO RQI BEING CLEAR.
                                                ;(DMR RUN MODE ONLY)
000004                  RCV=    BIT2            ;CSR -  IF 0, TRANSMIT   &   IF 1, RECEIVE

                        ;;SEL2 - BSEL2/BSEL3
000200                  RDO=    BIT7            ;SEL2 - DMR11 SETS TO INDICATE DATA READY FOR OUTPUT
000100                  IEO=    BIT6            ;SEL2 - SET TO ENABLE DMR11 TO INTERRUPT WHEN RDO

                        ;;SEL6 - BSEL6/BSEL7
020000                  BASEUP= BIT13           ;SEL6 - CONTROL OUT - RESPONSE TO DMR MODE BASE
                                                ;       TABLE UPDATE COMMAND.
010000                  RES=    BIT12           ;SEL6 - BASE IN -- WHEN SET CAUSES
                                                ;       RESUMPTION OF OPERATION
010000                  CTS=    BIT12           ;SEL6 - CONTROL OUT - CTS FAILED
004000                  SECN=   BIT11           ;SEL6 - CONTROL IN -- START TIME (3 SEC IF SET
                                                ;       1 SEC IF CLEAR)
002000                  HDX=    BIT10           ;SEL6 - HALF-DUPLEX  &  CLEAR FOR FULL-DUPLEX
002000                  CD=     BIT10           ;SEL6 - CONTROL OUT - CD GLITCHED
001000                  HALTC=  BIT9            ;SEL6 - EXTENDED CONTROL OUT - HALT COMPLETED
000400                  MAINT=  BIT8            ;SEL6 - DDCMP MAINTENANCE DURING CONTROL IN
000522                  DMR=    BIT8!122        ;SEL6 - BASE IN -- SET FOR DMR11 MODE
                                                ;       122 IS THE DMR PASSWORD FOR BSEL6 AND
                                                ;       BIT8 SETS THE DMR MODE BIT IN BSEL7
000400                  NXM=    BIT8            ;SEL6 - CONTROL OUT - NON EXISTENT MEMORY
000200                  STREC=  BIT7            ;SEL6 - CONTROL OUT - START RECEIVED
000100                  DISCON= BIT6            ;SEL6 - CONTROL OUT - DISCONNECT
000100                  DTR=    BIT6            ;SEL6 - MODEM WRITE - DATA TERMINAL READY
000040                  DMRRUN= BIT5            ;SEL6 - CONTROL OUT - DMR RUN MODE
000020                  TOLONG= BIT4            ;SEL6 - CONTROL OUT - MESSAGE TOO LONG
000010                  MAINT1= BIT3            ;SEL6 - MODEM WRITE - LOCAL MODEM LOOPBACK
000010                  MNTREC= BIT3            ;SEL6 - CONTROL OUT - MAINTENANCE MSG. RECEIVED
000004                  NOBFR=  BIT2            ;SEL6 - CONTROL OUT - NO BUFFER
000004                  MAINT2= BIT2            ;SEL6 - MODEM WRITE - REMOTE MODEM LOOPBACK
000002                  TOUT=   BIT1            ;SEL6 - CONTROL OUT - TIME OUT
000001                  NAKS=   BIT0            ;SEL6 - CONTROL OUT - NAKS THRESHOLD EXCEEDED


                        ;;*************************************************************************
                        ;;DDCMP COMMANDS - BITS 0 & 1 IN SEL0 AND SEL2

                        ;INPUT (SEL0)
000000                  BACCT=  0               ;BUF ADDRESS AND CHARACTER COUNT TRANSMIT
000001                  CNTRL=  1               ;CONTROL COMMAND (IN OR OUT)
000002                  HLT=    2               ;HALT COMMAND
000003                  BASEI=  3               ;BASE IN COMMAND
000004                  BACCR=  4               ;BUF ADDRESS AND CHARACTER COUNT RECEIVE
000005                  WMODEM= 5               ;WRITE MODEM STATUS REGISTER
000006                  EXERR=  6               ;ENABLE EXTENDED ERROR NOTIFICATION
000007                  DXERR=  7               ;DISABLE EXTENDED ERROR NOTIFICATION
000010                  DDMC=   10              ;DESELECT DMC LINE MODE
000011                  UPDATE= 11              ;REQUEST BASE TABLE UPDATE
000012                  TIMER=  12              ;SET REP/SELECT TIMER VALUE
000013                  THRESH= 13              ;SET THE FOLLOWING THRESHOLDS:
                                                ;NAKS RECVD
                                                ;NAKS SENT
                                                ;REP/SEL
```

```
                                                        ;NO BUFFER
000014                  RRAM=   14                      ;READ M8207 RAM (0-377)
000015                  INTER=  15                      ;WRITE INTERFACE IN AX3-15
000017                  RMODEM= 17                      ;READ MODEM STATUS (=NOP)

                        ;OUTPUT (SEL2)      NOTE: CNTRL IS USED FOR SEL2
000007                  CMD=    7                       ; ** MASK USED TO CLEAR COMMAND BITS 0-2 **

                        ;;*****************************************************************
                        ;;BASE TABLE OFFSETS
                                                        ;NOTE: THE OFFSETS FOR BASE+3.-BASE+10 WERE
                                                        ;INTENTIONALLY NOT LABELLED, BECAUSE THOSE LOCATIONS
                                                        ;MUST NOT BE CHANGED IN ORDER TO BE DMC COMPATIBLE.
                                                        ;THE LABELS BELOW CORRESPOND WITH THOSE USED IN THE
                                                        ;DMR MICROCODE.
000042                  R=      42                      ;#R - MESSAGE RECEIVED
000043                  N=      43                      ;#N - MESSAGE TRANSMITTED
000044                  A=      44                      ;#A - MESSAGE ACKNOWLEDGED
000045                  T=      45                      ;#T - NEXT MESSAGE TO BE TRANSMITTED
000046                  X=      46                      ;#X - LAST COMPLETED TRANSMISSION
000055                  PRETIM= 55                      ;PROGRAMMABLE REP/SEL TIMER VALUE.
000060                  TH1L=   60                      ;THRESHOLD LEVEL - NAKS RECEIVED .
000062                  TH2L=   62                      ;THRESHOLD LEVEL - NAKS SENT.
000064                  TH3L=   64                      ;THRESHOLD LEVEL - REP SENT.
000066                  TH4L=   66                      ;THRESHOLD LEVEL - NO BUFFER AVAILABLE.
000072                  ISP7=   72                      ;IMAGE OF SCRATCH PAD 7
000076                  ISP13=  76                      ;IMAGE OF SCRATCH PAD 13

                        ;;*****************************************************************
                        ;;INSTRUCTION DEFINITIONS

000207                  RETURN=207                      ;RETURN FROM SUB.     [=  JSR PC]


                        ;;*****************************************************************
                        ; MISC. EQUATES

000006                  LLOOP=  6                       ;LOCAL MODEM LOOPBACK
000007                  RLOOP=  7                       ;REMOTE MODEM LOOPBACK.
000015                  CR=     15                      ;ASCII CARRIAGE RETURN
000012                  LF=     12                      ;ASCII LINE FEED
```

```
                                .SBTTL  GLOBAL DATA SECTION

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



                                ;;*********************************************************************
                                ;DMR11 VECTOR AND REGISTER INDIRECT POINTERS

002226  000000                  DMRVEC: .WORD   0               ;DMR11 RECEIVER INTERRUPT VECTOR
002230  000000                  DMTVEC: .WORD   0               ;DMR11 TRANSMITTER INT. VECTOR
002232  000000                  CSR:    .WORD   0               ;POINTER TO DMR11 CONTROL STATUS REGISTER
002234  000000                  SEL2:   .WORD   0               ;POINTER TO DMR11 CONTROL OUT REGISTER (SEL 2)
002236  000000                  SEL4:   .WORD   0               ;POINTER TO DMR11 PORT REGISTER (SEL 4)
002240  000000                  SEL6:   .WORD   0               ;POINTER TO DMR11 PORT REGISTER (SEL 6)
        002232                  SEL0=   CSR                     ;CSR IS SEL0
        002232                  BSEL0=  CSR                     ;LOW BYTE OF CSR
002242  000000                  BSEL1:  .WORD   0               ;POINTER TO DMR11 CSR HIGH BYTE
        002234                  BSEL2=  SEL2                    ;LOW BYTE OF SEL2
002244  000000                  BSEL3:  .WORD   0               ;POINTER TO SEL2 HIGH BYTE
        002236                  BSEL4=  SEL4                    ;LOW BYTE OF SEL4
002246  000000                  BSEL5:  .WORD   0               ;POINTER TO SEL4 HIGH BYTE
        002240                  BSEL6=  SEL6                    ;LOW BYTE OF SEL6
002250  000000                  BSEL7:  .WORD   0               ;POINTER TO SEL6 HIGH BYTE

                                ;;*********************************************************************
                                ;;OTHER HARDWARE PARAMETERS

002252  000000                  WTYPE:  .WORD   0               ;MICROPROCESSOR TYPE
002254  000000                  DMTURN: .WORD   0               ;TURN AROUND TYPE (0-7)
002256  000000                  MICRO:  .WORD   0               ;MICRODIAGNOSTICS (IF 1(YES) - ENABLED)

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



002260  000000                  DMRFLG: .WORD   0               ;FLAG SET WHEN DMR MODE IS REQUESTED IN
                                                                ;THE BASE IN COMMAND.  USED TO FLAG THAT
                                                                ;A DMR MODE ACKNOWLEDGE IS EXPECTED.
002262  000000                  INFACE: .WORD   0               ;FLAG TO ALLOW CHANGE OF INTERFACE TYPE
                                                                ;BY WRITING AX3-15.  FLAG SET/CLEARED IN INIT.
002264  000000                  FRSTIM: .WORD   0               ;FLAG=0 IF PROGRAM JUST LOADED
002266  000000                  FRSPAS: .WORD   0               ;FLAG=0 IF FIRST PASS AFTER LOAD
002270  000000                  STARES: .WORD   0               ;FLAG=0 IF 1ST TIME THRU AFTER STA OR RES

                                                                ;FOLLOWING PARAMETERS ARE USED IN THE
                                                                ;INTERRUPT TESTS (TESTS 15-19):
002272  000000                  START:  .WORD   0               ;FLAG SET WHEN A CONTROL IN HAS BEEN ISSUED.
002274  000000                  RESUME: .WORD   0               ;FLAG SET WHEN A BASE IN WITH RESUME DESIRED.
002276  000000                  DMCMDE: .WORD   0               ;FLAG SET WHEN A BASE IN WITH DMC MODE DESIRED
002300  000000                  MNTMDE: .WORD   0               ;FLAG SET WHEN MAINTENANCE MODE IS DESIRED.
002302  000000                  MMANAG: .WORD   0               ;FLAG RETURNED IN THE SUBROUTINE $BUFFS
                                                                ;MMANAG=1, MEMORY MANAGED BUFFERS USED
```

```
002304  000000          AX3:     .WORD   0          ;BIT PATTERN TO WRITE INTO AX3-15, WHEN
                                                    ;IT IS REQUESTED TO ALLOW INTERFACE
                                                    ;SELECTION. (TEST CONFIGURATION 1-4)
                                                    ;BIT0 = TEST BIT (MUST BE SET TO ALLOW SELECT)
                                                    ;BIT3 = INTEGRAL MODEM
                                                    ;BIT4 = V.35
                                                    ;BIT6 = EIA
                                                    ;BIT7 = RS422
002306  000000          WMAINT: .WORD   0          ;FLAG SET WHEN IT IS NECESSARY TO WRITE
                                                    ;MODEM MAINTENANCE BITS (MAINTENANCE 1 & 2)
                                                    ;THIS FLAG IS SET OR CLEARED IN THE INIT CODE.
002310  000000          MANUF:  .WORD   0          ;******* MANUFACTURING USE ONLY *******
                                                    ;THIS WORD MAY BE PATCHED TO A NON ZERO WHEN
                                                    ;MANUFACTURING SPECIAL TEST CONNECTORS ARE
                                                    ;USED.  THIS WILL ALLOW MAINTENANCE BITS
                                                    ;TO BE SET.


                        ;;*****************************************************************
                        ;PROGRAM VARIABLES
                                                    ;WORD1-WORD3 VALUES DETERMINED IN INIT
                                                    ;CODE DEPENDING ON THE BAUD RATE.
002312  000000          WAIT1:  .WORD   0          ;VALUE FOR TIMEOUT COUNTER
                                                    ;USED IN $WAIT SUBROUTINE
002314  000000          WAIT2:  .WORD   0          ;VALUE FOR TIMEOUT COUNTER USED IN $MSCLR
                                                    ;AND $CLRQI SUBROUTINES.
002316  000000          WAIT3:  .WORD   0          ;VALUE FOR TIMEOUT COUNTER USED IN $INOUT.
002320  000000          WAIT4:  .WORD   0          ;WORD USED AS OUTER LOOP COUNTER IN $INOUT.
002322  000000          BUFSIZ: .WORD   0          ;CALCULATED BUFFER SIZE IN BYTES.
002324  000000          BUFNUM: .WORD   0          ;# OF RECEIVE & TRANSMIT BUFFERS.  THIS
                                                    ;VARIABLE IS USED IN THE SUBROUTINE $BUFFS


002326  000000          INRCV:  .WORD   0          ;COUNTER FOR # OF BA/CC IN RECEIVES.
002330  000000          INXMIT: .WORD   0          ;COUNTER FOR # OF BA/CC IN TRANSMITS.
002332  000000          OUTRCV: .WORD   0          ;COUNTER FOR # OF BA/CC OUT RECEIVES.
002334  000000          OUTXMT: .WORD   0          ;COUNTER FOR # OF BA/CC OUT TRANSMITS.


                        ;;*****************************************************************
                        ;* MISCELLANEOUS STORAGE
002336  000000          TEMP:   .WORD   0          ;SCRATCH WORD USED FOR MISC. STORAGE IN SUB.
002340  000000          SAVE:   .WORD   0          ;SCRATCH WORD USED FOR MISC. STORAGE IN SUB.
002342  000000          FLAG:   .WORD   0          ;SCRATCH WORD USED FOR MISC. FLAG IN SUB.
002344  000000          SFLAG:  .WORD   0          ;FLAG USED IN TEST 15 FOR LOOP CONTROL.
002346  000000          SKIP:   .WORD   0          ;FLAG USED IN TEST 7 TO MARK WHETHER TO SKIP
                                                    ;A PORTION OF THE TEST.
002350  000000          NXMFLG: .WORD   0          ;FLAG USED TO MARK THAT THE DMR ADDRESS IS NXM

002352  000000          INFLAG: .WORD   0          ;FLAG USED IN INISR TO FLAG WHEN ALL THE
                                                    ;BA/CC INS HAVE BEEN DONE.


002354  000000          OUTFLG: .WORD   0          ;FLAG USED IN OUTISR TO FLAG WHEN ALL THE
                                                    ;BA/CC OUTS HAVE BEEN DONE.
002356  000000          RESFLG: .WORD   0          ;FLAG USED IN IN ISR TO FLAG THAT THE RESUME
                                                    ;COMMAND HAS JUST BEEN ISSUED.
002360  000000          ERRFLG: .WORD   0          ;FLAG USED IN THE WAIT SUBROUTINES ($WAIT
                                                    ; & $CLRQI) TO RETURN ERROR CONDITON (SEC)
```

```
002362  000000                  LAST:   .WORD   0               ;WORD USED TO STORE LAST COMMAND PROCESSED IN
                                                                ;THE INPUT INTERRUPT ROUTINE.
002364  000000                  ERROR:  .WORD   0               ;ERROR STORAGE
002366  000000                  LOGDEV: .WORD   0               ;LOGICAL DEVICE NUMBER
002370  000000                  PSTACK: .WORD   0               ;CONTAINS BASE LEVEL PROGRAM SP
002372  000000                  SUBRPC: .WORD   0               ;PC OF SUBR CALL FOR ERROR REPORTS
002374  000000                  NESTPC: .WORD   0               ;FLAG TO NOTIFY WHEN A SUBR IS NESTED
                                                                ;IN ANOTHER SUBROUTINE (WHEN SET)
002376  000000                  CLRNO:  .WORD   0               ;THIS WORD IS INCREMENTED DURING EACH MASTER
                                                                ;CLEAR.  THIS WILL ALLOW EVERY OTHER MASTER
                                                                ;CLEAR TO RUN THE MICRO TESTS.

                                                                ;ROM CHECK VARAIBLES
002400  000000                  LOCRC:  .WORD   0               ;CRC STORAGE FOR LOW BYTE CHIP
002402  000000                  HICRC:  .WORD   0               ;CRC STORAGE FOR HIGH BYTE CHIP
002404  000000                  LOWORD: .WORD   0               ;TEMP. WORD CONTAINING 2 CONSECUTIVE LOW BYTES
002406  000000                  HIWORD: .WORD   0               ;TEMP. WORD CONTAINING 2 CONSECUTIVE HI BYTES
002410  000000                  ROMADR: .WORD   0               ;POINTER TO ROM ADDRESS.
002412  000000                  CHIPNO: .WORD   0               ;CHIP NUMBER BEING CHECKED.
002414  000000                  COUNT:  .WORD   0               ;COUNTER USED IN THE $WAIT SUBROUTINE.
                                        .EVEN

                                ;;*****************************************************************
                                ;;*****************************************************************
                                ;;BUFFER AREA
                                        ;       ** CCITT PSUEDO-RANDOM TEST PATTERN **
                                        ; THE FOLLOWING 32 WORDS TRANSLATE INTO A 512 BIT PATTERN
                                        ; THAT WAS GENERATED ACCORDING TO CCITT RECOMMENDATION V.52.  THIS
                                        ; PATTERN WAS GENERATED BY A 9 BIT SHIFT REGISTER (INITIALIZED
                                        ; AS 1S) WHOSE 5TH AND 9TH BITS ARE XORED.  THIS XOR RESULT IS SHIFTED
                                        ; INTO THE 1ST BIT OF THE REGISTER AS THE REGISTER IS SHIFTED RIGHT.
                                        ; THE 9TH BIT (OR BIT SHIFTED OUT) IS SHIFTED INTO THE BIT PATTERN.
                                        ; NOTE: CCITT RECOMMENDED 511 BITS, I'VE EXTENDED THIS BY 1 BIT TO END
                                        ; ON A WORD BOUNDARY.
002416                          $CCITT:
002416  177603  157427  031011          .WORD   177603,157427,031011
002424  047321  163715  105221          .WORD   047321,163715,105221
002432  143325  142304  040041          .WORD   143325,142304,040041
002440  014116  052606  172334          .WORD   014116,052606,172334
002446  105025  123754  111337          .WORD   105025,123754,111337
002454  111523  030030  145064          .WORD   111523,030030,145064
002462  137642  143531  063617          .WORD   137642,143531,063617
002470  135015  066730  026575          .WORD   135015,066730,026575
002476  052012  053627  070071          .WORD   052012,053627,070071
002504  151172  165044  031605          .WORD   151172,165044,031605
002512  166632  016741                  .WORD   166632,016741

                                ;;*****************************************************************
                                ;; TRANSMIT BUFFER (SMALL)

002516  000000                  TFLAG:  .WORD   0               ;FLAG FOR STATUS OF TRANSMIT BUFFER
        000044                  TCOUNT= 36.                     ;CHARACTER COUNT OF TBUF
002520     101     102     103  TBUF:   .ASCIZ  /ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789/
002523     104     105     106
002526     107     110     111
```

```
        002531     112     113     114
        002534     115     116     117
        002537     120     121     122
        002542     123     124     125
        002545     126     127     130
        002550     131     132     060
        002553     061     062     063
        002556     064     065     066
        002561     067     070     071
        002564     000
                                        .EVEN


                                ;;*****************************************************************
                                ;; RECEIVE BUFFER (SMALL)

002566  000000                  RFLAG:  .WORD   0               ;FLAG FOR STATUS OF RECEIVE BUFFER
        000044                  RCOUNT= 36.                     ;CHARACTER COUNT OF RBUF
002570                          RBUF:   .BLKB   38.             ;36. BYTE BUFFER + 2 BYTES USED
                                                                ;TO MARK THE END OF THE RECEIVE BUFFER
                                        .EVEN

                                ;;*****************************************************************
                                ;; BASE TABLE

002636                          BASE:   .BLKB   256.            ;MICROPROCESSOR MEMORY ALLOCATION

                                ;;*****************************************************************
                                ;; TRANSMIT AND RECEIVE BUFFER POINTERS

003236                          XMTBUF: .BLKW   128.            ;POINTERS TO TRANSMIT BUFFERS (UP TO 64)
                                                                ;1 WORD FOR ADDRESS AND 1 WORD FOR CHAR. COUNT
003636                          RCVBUF: .BLKW   128.            ;POINTERS TO RECEIVE BUFFERS (UP TO 64).

                                ;;*****************************************************************
                                ;; BUFFER AREA (LARGE)

004236                          BIGBUF: .BLKB   4000            ;MAX BUFFER (2K BYTES)
```

```
                                                .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
                                                ;;*************************************************************************
 010236                                                 DEVTYP  <DMR11>
 010236                                                                                 L$DVTYP::
 010236       104     115     122                                                               .ASCIZ  /DMR11/
 010241       061     061     000
                                                                                                .EVEN

                                                ;;***************************************************************************
                                                ;* TITLE OF PROGRAM
                                                ;;***************************************************************************
 010244                                                 DESCRIPT   <DMR-11 FUNCTIONAL TESTS>
 010244                                                                                 L$DESC::
 010244       104     115     122                                                               .ASCIZ  /DMR-11 FUNCTIONAL T
 010247       055     061     061
 010252       040     106     125
 010255       116     103     124
 010260       111     117     116
 010263       101     114     040
 010266       124     105     123
 010271       124     123     000
                                                                                                .EVEN



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

```
                        .SBTTL  GLOBAL SUBROUTINES

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


                        ;;*********************************************************************
                        ;
                        ;       MACROS - THERE ARE 2 BASIC TYPES OF MACROS USED
                        ;                        1. NORMAL MACROS -
                        ;                        2. DMR11 FUNCTIONAL MACROS - THESE MACROS MAY
                        ;                           BE NOTHING MORE THAN A CALL TO A SUBROUTINE,
                        ;                           BUT THEY ARE DISTINCT DMR FUNCTIONS WHICH CAN
                        ;                           DISTINGUISHED BY THE IN-LINE MACRO NAME.
                        ;
                        ;;*********************************************************************

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

                        ;;*********************************************************************
                        ; WAIT $FLAG MACRO - THIS MACRO INTERPUTS THE $FLAG AS RDI, RQI OR RDO.
                        ;                    IF RDI OR RDO, THE SUBROUTINE CALLED WILL WAIT UNTIL
                        ;                    THE RESPECTIVE BIT IS SET.  IF RQI, THE SUBROUTINE
                        ;                    CALLED WILL CLEAR RQI AND WAIT UNTIL RDI IS CLEARED.
                        ;;*********************************************************************

                                .MACRO  WAIT    $FLAG
                                .NLIST
                                .LIST ME
                                .LIST
                                                        ;**** MACRO EXPANSION ****
                                .IF     B, $FLAG
                                .ERROR  FLAG    ;## MISSING FLAG FOR WAIT - EXPANSION ABORT ##
                                .MEXIT
                                .ENDC
                                .IF     IDN $FLAG,RQI
                                JSR     PC, $CLRQI      ;CLEAR RQI AND WAIT FOR IT TO BE CLEARED.
                                .ENDC
                                .IF     IDN $FLAG,RDI
                                JSR     PC, $WAIT       ;CALL WAIT ROUTINE
                                        .WORD   0       ;FLAG THAT WE'RE WAITING FOR RDI
                                .ENDC
                                .IF     IDN $FLAG,RDO
                                JSR     PC, $WAIT       ;CALL WAIT ROUTINE
                                        .WORD   1       ;FLAG THAT WE'RE WAITING FOR RDO
```

```
                        .ENDC
                                                ;****                   ****
                        .NLIST ME
                        .ENDM


                ;;*****************************************************************
                ; CLEAR MACRO - THIS IS A DMR FUNCTIONAL MACRO WHICH CALLS THE
                ;               $MSCLR SUBROUTINE
                ;;*****************************************************************
                        .MACRO  CLEAR
                        .NLIST
                        .LIST ME
                        .LIST
                                                ;**** MACRO EXPANSION ****
                        JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                ;****                   ****
                        .NLIST ME
                        .ENDM
```

```
                        ;;*****************************************************************
                        ; BASEIN MACRO - THIS IS A DMR FUNCTIONAL MACRO WHICH CALLS THE
                        ;                $BASEIN SUBROUTINE (WITH DEFAULT ARGUMENTS
                        ;                IF ARGUMENTS NOT GIVEN)
                        ;;*****************************************************************
                                .MACRO  BASEIN  $A,$B,$C
                                .NLIST
                                .LIST ME
                                .LIST
                                                        ;**** MACRO EXPANSION ****
                                .IF     B       $A
                                JSR     PC, $BASEI      ;CALL BASE IN ROUTINE WITH DEFAULTS
                                        .WORD   LPLU    ;SET LINE UNIT LOOP
                                        .WORD   BASE    ;BASE TABLE ADDRESS
                                        .WORD   DMR     ;DMR-11 MODE
                                .IFF
                                JSR     PC, $BASEI      ;CALL BASE IN ROUTINE
                                        .WORD   $A      ;MAINTENANCE MODE BITS TO SET IN BSEL1
                                        .WORD   $B      ;BASE TABLE ADDRESS
                                        .WORD   $C      ;MODE
                                .ENDC
                                                        ;****                   ****
                                .NLIST ME
                                .ENDM



                        ;;*****************************************************************
                        ; CNTRIN MACRO - THIS IS A DMR FUNCTIONAL MACRO WHICH CALLS THE
                        ;                $CNTIN SUBROUTINE (WITH DEFAULT ARGUMENTS
                        ;                IF ARGUMENTS NOT GIVEN)
                        ;;*****************************************************************
                                .MACRO  CNTRIN  $A
                                .NLIST
                                .LIST ME
                                .LIST
                                                        ;**** MACRO EXPANSION ****
                                .IF     B       $A
                                JSR     PC, $CNTIN      ;CALL CONTROL IN ROUTINE WITH DEFAULT
                                        .WORD   0       ;SEL6 - FULL DUPLEX, RUN MODE, 1 SEC START.
                                .IFF
                                JSR     PC, $CNTIN      ;CALL CONTROL IN ROUTINE
                                        .WORD   $A      ;SEL6 - (DUPLEX, MODE)
                                .ENDC
                                                        ;****                   ****
                                .NLIST ME
                                .ENDM
```

```
                        ;;*****************************************************************
                        ; DMRIN MACRO -  THIS IS A DMR FUNCTIONAL MACRO WHICH CALLS THE
                        ;                $DMRIN SUBROUTINE
                        ;;*****************************************************************
                                .MACRO  DMRIN   $A,$B,$C
                                .NLIST
                                .LIST ME
                                .LIST
                                                        ;**** MACRO EXPANSION ****
                                .IF     B       $A
                                .ERROR  DMRIN; ## MISSING ARGUMENTS-EXPANSION ABORT ##
                                .MEXIT
                                .ENDC
                                JSR     PC, $DMRIN      ;CALL DMR MODE INPUT ROUTINE
                                        .WORD   $A      ;INPUT COMMAND
                                .IF     B       $B
                                        .WORD   0       ;NO SEL4
                                .IFF
                                        .WORD   $B      ;SEL4 VALUE (OR BITS TO CLEAR IN BSEL6)
                                .ENDC
                                .IF     B       $C
                                        .WORD   0       ;NO SEL6
                                .IFF
                                        .WORD   $C      ;SEL6 VALUE (OR BITS TO SET IN BSEL6)
                                .ENDC
                                                        ;****                   ****
                                .NLIST ME
                                .ENDM



                        ;;*****************************************************************
                        ; SHUTDN MACRO - THIS IS A DMR FUNCTIONAL MACRO WHICH CALLS THE
                        ;                $HALT SUBROUTINE
                        ;;*****************************************************************
                                .MACRO  SHUTDN
                                .NLIST
                                .LIST ME
                                .LIST
                                                        ;**** MACRO EXPANSION ****
                                JSR     PC, $HALT       ;DMR HALT ROUTINE.
                                                        ;****                   ****
                                .NLIST ME
                                .ENDM
```

```
;;*****************************************************************
; BACCIR MACRO -  THIS IS A DMR FUNCTIONAL MACRO WHICH CALLS THE
;                 $BACC SUBROUTINE (WITH DEFAULT ARGUMENTS
;                 IF ARGUMENTS NOT GIVEN)
;;*****************************************************************
        .MACRO  BACCIR  $A,$B
        .NLIST
        .LIST ME
        .LIST
                                ;**** MACRO EXPANSION ****
        .IF     B       $A
        JSR     PC, $BACC       ;CALL BA/CC IN ROUTINE WITH DEFAULTS
                .WORD   RQI!BACCR       ;BA/CC IN RECEIVE COMMAND
                .WORD   RBUF    ;RECEIVE BUFFER
                .WORD   RCOUNT  ;RECEIVE CHARACTER COUNT
        .IFF
        JSR     PC, $BACC       ;CALL BA/CC IN ROUTINE
                .WORD   RQI!BACCR       ;BA/CC IN RECEIVE COMMAND
                .WORD   $A      ;BUFFER ADDRESS BITS 0-15
                .WORD   $B      ;BA BITS 16/17 AND CHAR. COUNT
        .ENDC
                                ;****                   ****
        .NLIST ME
        .ENDM


;;*****************************************************************
; BACCIT MACRO -  THIS IS A DMR FUNCTIONAL MACRO WHICH CALLS THE
;                 $BACC SUBROUTINE (WITH DEFAULT ARGUMENTS
;                 IF ARGUMENTS NOT GIVEN)
;;*****************************************************************
        .MACRO  BACCIT  $A,$B
        .NLIST
        .LIST ME
        .LIST
                                ;**** MACRO EXPANSION ****
        .IF     B       $A
        JSR     PC, $BACC       ;CALL BA/CC IN ROUTINE WITH DEFAULTS
                .WORD   RQI!BACCT       ;BA/CC IN TRANSMIT COMMAND
                .WORD   TBUF    ;TRANSMIT BUFFER ADDRESS
                .WORD   TCOUNT  ;TRANSMIT CHARACTER COUNT
        .IFF
        JSR     PC, $BACC       ;CALL BA/CC IN ROUTINE
                .WORD   RQI!BACCT       ;BA/CC IN TRANSMIT COMMAND
                .WORD   $A      ;BUFFER ADDRESS BITS 0-15
                .WORD   $B      ;BA BITS 16 & 17 AND CHAR. COUNT
        .ENDC
                                ;****                   ****
        .NLIST ME
        .ENDM
```

```
                                ;;*****************************************************************
                                ;;*****************************************************************
                                ;
                                ;                    SUBROUTINE $WAIT
                                ;
                                ;            FUNCTION -  TO WAIT FOR RDI TO BE SET IN SEL0
                                ;                        OR RDO TO BE SET IN SEL2
                                ;
                                ;       CALLING FORMAT:         JSR     PC,     $WAIT
                                ;                               .WORD   FLAG
                                ;                               (MACRO CALL -- WAIT RDI)
                                ;
                                ;       NESTING LEVEL    - MAY BE CALLED FROM ANOTHER SUBROUTINE
                                ;
                                ;       ENTRY CONDITIONS - FLAG  = 1   -   WAIT FOR RDO
                                ;                                = 0   -   WAIT FOR RDI
                                ;                          WAIT1 = DELAY COUNTER (DETERMINED IN INIT.)
                                ;                          NESTPC= 1   -   ROUTINE NESTED WITHIN ANOTHER
                                ;                                          SUBROUTINE.
                                ;                                = 0   -   ROUTINE NOT NESTED.
                                ;
                                ;       EXIT CONDITIONS  - EITHER RDI OR RDO BIT SET AS EXPECTED
                                ;                               OR (ERROR CONDITONS):
                                ;                               1. RDI OR RDO SET, BUT NOT THE EXPECTED ONE
                                ;                                  THE USER WILL BE INFORMED.  HOWEVER,
                                ;                                  THIS WILL NOT NECESSARILY BE AN ERROR.
                                ;                               2. BIT NOT SET BEFORE DELAY EXPIRED.
                                ;                                  THIS WILL RESULT IN A HARD ERROR MESSAGE
                                ;                                  AND THE CARRY BIT WILL BE SET.  THE CARRY
                                ;                                  BIT SET FLAG THE ERROR CONDITION.
                                ;
                                ;
                                ;    REGISTERS DESTROYED - RESTORED
                                ;
                                ;;*****************************************************************
                                ;;*****************************************************************
010274                          $WAIT:
010274  005037  002360                  CLR     ERRFLG          ;CLEAR ERROR FLAG
010300  005037  002414                  CLR     COUNT           ;CLEAR DELAY COUNTER
010304  005737  002374                  TST     NESTPC          ;IS THIS NESTED IN ANOTHER SUBROUTINE?
010310  001005                          BNE     10$             ;YES - USE THE SUBRPC ALREADY CALCULATED.
010312  011637  002372                  MOV     (SP),SUBRPC     ;SAVE PC AFTER THE CALL TO $WAIT.
010316  162737  000004  002372          SUB     #4,SUBRPC       ;BACKUP TO THE PC OF THE ACTUAL CALL
010324                          10$:
010324  017637  000000  002336          MOV     @(SP),TEMP      ;GET THE FLAG FOR RDI OR RDO
010332  062716  000002                  ADD     #2,(SP)         ;INC THE PC LEFT ON THE STACK TO POINT
                                                                ;PAST THE FLAG ARGUMENT
010336  010046                          MOV     R0,-(SP)        ;SAVE R0
010340  010146                          MOV     R1,-(SP)        ;SAVE R1
010342  013701  002312                  MOV     WAIT1,R1        ;DELAY COUNTER DETERMINED BY BAUD RATE
                                                                ;(DETERMINED IN INIT ROUTINE).
010346                          30$:
010346  005000                          CLR     R0              ;INNER LOOP COUNT OF DELAY COUNTER
010350                          40$:
010350  032777  000200  171656          BIT     #RDO,@SEL2      ;IS THE RDO BIT SET IN SEL2?
010356  001036                          BNE     60$             ;YES - EXIT BIT CHECK LOOP.
010360  032777  000200  171644          BIT     #RDI,@SEL0      ;IS THE RDI BIT SET IN SEL0?
```

```
010366  001064                          BNE     70$             ;YES - EXIT
010370                                  BREAK                   ;CALL SUPERVISOR - ALLOW CONSOLE INTERRUPT.
010370  104422                                                                          TRAP    C$BRK
010372  005237  002414                  INC     COUNT           ;INCREMENT DELAY COUNTER.
010376  005300                          DEC     R0              ;LOOP UNTIL R0 RETURNS TO 0
010400  001363                          BNE     40$
010402                                  DELAY   1               ;DELAY 100 MICROSECONDS
010402  012727  000001                                                                  MOV     #1,(PC)+
010406  000000                                                                          .WORD   0
010410  013727  002116                                                                  MOV     L$DLY,(PC)+
010414  000000                                                                          .WORD   0
010416  005367  177772                                                                  DEC     -6(PC)
010422  001375                                                                          BNE     .-4
010424  005367  177756                                                                  DEC     -22(PC)
010430  001367                                                                          BNE     .-20
                                                        ;BETWEEN LOOPS.
010432  005301                          DEC     R1              ;REPEAT UNTIL MAXIMUM LOOP SATISFIED.
010434  001344                          BNE     30$
010436                                  ERRDF   1,EMG1,ERRG2    ;TIME OUT ERROR
010436  104455                                                                          TRAP    C$ERDF
010440  000001                                                                          .WORD   1
010442  017704                                                                          .WORD   EMG1
010444  015112                                                                          .WORD   ERRG2
010446  005237  002360                  INC     ERRFLG          ;SET ERROR FLAG
010452  000445                          BR      100$            ;BRANCH TO COMMON EXIT.
010454                          60$:
010454  005737  002336                  TST     TEMP            ;WERE WE WAITING FOR THE RDO FLAG?
010460  001042                          BNE     100$            ;YES - OK, EXIT.
010462  022737  000001  002364          CMP     #CNTRL,ERROR    ;IS THIS CONTROL OUT ERROR EXPECTED?
010470  001436                          BEQ     100$            ;IF YES, DON'T REPORT THE FOLLOWING ERRORS.
010472                                  PRINTB #FMS1            ;RECEIVED AN RDO, WHEN WAITING FOR RDI
010472  012746  010616                                                                  MOV     #FMS1,-(SP)
010476  012746  000001                                                                  MOV     #1,-(SP)
010502  010600                                                                          MOV     SP,R0
010504  104414                                                                          TRAP    C$PNTB
010506  062706  000004                                                                  ADD     #4,SP
010512  032777  000001  171514          BIT     #CNTRL,@SEL2    ;IS THIS A CONTROL OUT?
010520  001422                          BEQ     100$            ;NO NEED TO CHECK ERROR CODES.
010522                                  ERRDF   9,EMG9,ERRG2    ;UNEXPECTED CONTROL OUT.
010522  104455                                                                          TRAP    C$ERDF
010524  000011                                                                          .WORD   9
010526  020026                                                                          .WORD   EMG9
010530  015112                                                                          .WORD   ERRG2
010532  005237  002360                  INC     ERRFLG          ;SET ERROR FLAG.
010536  000413                          BR      100$
010540                          70$:
010540  005737  002336                  TST     TEMP            ;WERE WE WAITING FOR THE RDI FLAG?
010544  001410                          BEQ     100$            ;YES - OK, EXIT
010546                                  PRINTB  #FMS2           ;RECEIVED AN RDI, WHEN WAITING FOR RDO
010546  012746  010651                                                                  MOV     #FMS2,-(SP)
010552  012746  000001                                                                  MOV     #1,-(SP)
010556  010600                                                                          MOV     SP,R0
010560  104414                                                                          TRAP    C$PNTB
010562  062706  000004                                                                  ADD     #4,SP
010566                          100$:
010566  005737  002374                  TST     NESTPC          ;WAS THIS NESTED IN ANOTHER SUBROUTINE?
010572  001002                          BNE     105$            ;IF YES - LEAVE THE SUBROUTINE PC ALONE
```

```
 88 010574  005037  002372                    CLR     SUBRPC          ;CLEAR THE PC
 89 010600                            105$:
 90 010600  012601                            MOV     (SP)+,R1        ;RESTORE R1
 91 010602  012600                            MOV     (SP)+,R0        ;RESTORE R0
 92 010604  005737  002360                    TST     ERRFLG          ;WAS THERE AN ERROR (CARRY CLEARED ON TST)
 93 010610  001401                            BEQ     110$            ;IF NOT, RETURN WITH CARRY CLEAR
 94 010612  000261                            SEC                     ;SET CARRY.
 95 010614                            110$:
 96 010614  000207                            RETURN
 97
 98 010616     045     116     045  FMS1:    .ASCIZ  /%N%ARDO SET EXPECTED RDI%N/
    010621     101     122     104
    010624     117     040     123
    010627     105     124     040
    010632     105     130     120
    010635     105     103     124
    010640     105     104     040
    010643     122     104     111
    010646     045     116     000
 99 010651     045     116     045  FMS2:    .ASCIZ  /%N%ARDI SET EXPECTED RDO%N/
    010654     101     122     104
    010657     111     040     123
    010662     105     124     040
    010665     105     130     120
    010670     105     103     124
    010673     105     104     040
    010676     122     104     117
    010701     045     116     000
100                                           .EVEN
101
102
```

```
                                        ;;*******************************************************************
                                        ;;*******************************************************************
                                        ;
                                        ;                    SUBROUTINE $CLRQI
                                        ;
                                        ;            FUNCTION -  TO CLEAR RQI AND WAIT FOR RDI TO BE CLEARED
                                        ;
                                        ;     CALLING FORMAT:          JSR     PC,     $CLRQI
                                        ;                              (MACRO CALL -- WAIT RQI)
                                        ;
                                        ;     NESTING LEVEL    - MAY BE NESTED WITHIN ANOTHER SUBROUTINE
                                        ;
                                        ;     ENTRY CONDITIONS - WAIT2 = DELAY COUNTER (DETERMINED IN INIT. ROUTINE)
                                        ;                        NESTPC= 1   -   ROUTINE NESTED WITHIN ANOTHER
                                        ;                                        SUBROUTINE.
                                        ;                              = 0   -   ROUTINE NOT NESTED.
                                        ;
                                        ;      EXIT CONDITIONS - 1. NON ERROR, DMR READY TO RECEIVE THE NEXT COMMAND
                                        ;                        2. ERROR IF RDI DOES NOT CLEAR BEFORE THE
                                        ;                           DELAY ROUTINE EXPIRES. AN ERROR MESSAGE WILL
                                        ;                           OCCUR.  ALSO A CARRY BIT WILL BE SET TO FLAG
                                        ;                           THE ERROR FOR THE USER.
                                        ;
                                        ;
                                        ;   REGISTERS DESTROYED - RESTORED
                                        ;
                                        ;;*******************************************************************
                                        ;;*******************************************************************
010704                                  $CLRQI:
010704  005037  002360                          CLR     ERRFLG          ;CLEAR ERROR FLAG
010710  042777  000040  171314                  BIC     #RQI,@SEL0      ;REQUEST INPUT CLEAR
010716  005737  002374                          TST     NESTPC          ;IS THIS NESTED IN ANOTHER SUBROUTINE?
010722  001005                                  BNE     10$             ;YES - USE SUBRPC CALCULATED
010724  011637  002372                          MOV     (SP),SUBRPC     ;SAVE THE PC AFTER THE CALL TO $WAIT.
010730  162737  000004  002372                  SUB     #4,SUBRPC       ;BACKUP TO THE PC OF THE ACTUAL CALL.
010736                                  10$:
010736  010046                                  MOV     R0,-(SP)        ;SAVE R0
010740  010146                                  MOV     R1,-(SP)        ;SAVE R1
010742  013701  002314                          MOV     WAIT2,R1        ;GET THE DELAY COUNTER (DETERMINED BY
                                                                        ;BAUD RATE IN INIT ROUTINE)
010746                                  12$:
010746  005000                                  CLR     R0              ;INNER LOOP COUNT
010750                                  20$:
010750  032777  000200  171254                  BIT     #RDI,@SEL0      ;IS THE RDI BIT CLEAR IN SEL0?
010756  001427                                  BEQ     30$             ;YES - EXIT
010760                                          BREAK                   ;CALL SUPERVISOR - ALLOW CONSOLE INTERRUPT.
010760  104422                                                                          TRAP    C$BRK
010762  005300                                  DEC     R0              ;LOOP UNTIL R0 RETURNS TO 0
010764  001371                                  BNE     20$
010766                                          DELAY   1               ;DELAY 100 MICROSECONDS
010766  012727  000001                                                                  MOV     #1,(PC)+
010772  000000                                                                          .WORD   0
010774  013727  002116                                                                  MOV     L$DLY,(PC)+
011000  000000                                                                          .WORD   0
011002  005367  177772                                                                  DEC     -6(PC)
011006  001375                                                                          BNE     .-4
011010  005367  177756                                                                  DEC     -22(PC)
```

```
        011014  001367                                                                  BNE     .-20
     50 011016  005301                  DEC     R1              ;REPEAT UNTIL MAXIMUM LOOP SATISFIED.
     51 011020  001352                  BNE     12$
     52 011022                          ERRDF   1,EMG1,ERRG2    ;TIME OUT ERROR
        011022  104455                                                                  TRAP    C$ERDF
        011024  000001                                                                  .WORD   1
        011026  017704                                                                  .WORD   EMG1
        011030  015112                                                                  .WORD   ERRG2
     53 011032  005237  002360          INC     ERRFLG          ;SET ERROR FLAG
     54 011036                  30$:
     55 011036  005737  002374          TST     NESTPC          ;WAS THIS A NESTED ROUTINE?
     56 011042  001002                  BNE     40$             ;IF YES - LEAVE THE SUBRPC ALONE
     57 011044  005037  002372          CLR     SUBRPC          ;CLEAR THE PC
     58 011050                  40$:
     59 011050  012601                  MOV     (SP)+,R1        ;RESTORE R1
     60 011052  012600                  MOV     (SP)+,R0        ;RESTORE R0
     61 011054  005737  002360          TST     ERRFLG          ;WAS THERE AN ERROR? (CARRY CLEARED ON TST)
     62 011060  001401                  BEQ     50$             ;IF NOT - RETURN WITH CARRY CLEAR
     63 011062  000261                  SEC                     ;SET CARRY.
     64 011064                  50$:
     65 011064  000207                  RETURN
     66
     67
```

```
                                ;;*******************************************************************
                                ;;*******************************************************************
                                ;
                                ;                       SUBROUTINE $MSCLR
                                ;
                                ;               FUNCTION -  TO PERFORM A MASTER CLEAR FOR THE DMR11
                                ;
                                ;       CALLING FORMAT:         JSR     PC,     $MSCLR
                                ;                               (MACRO CALL -- CLEAR)
                                ;
                                ;       NESTING LEVEL     - MAY ONLY BE CALLED FROM IN-LINE CODE (TEST,
                                ;                           SUBTEST OR TEST SEGMENT)
                                ;
                                ;       ENTRY CONDITIONS - WAIT2 = DELAY COUNTER (DETERMINED BY INIT. ROUTINE)
                                ;                          CLRNO = EVEN OR ODD COUNT.  THE ACTUAL # IS NOT
                                ;                                  SIGNIFICANT, HOWEVER IF BIT 0 IS SET
                                ;                                  THEN THE MICROTEST IS SET ALONG WITH
                                ;                                  THE MASTER CLEAR. THIS ROUTINE WILL INCR.
                                ;                                  THE VALUE.  THIS WILL RESULT IN THE MICRO
                                ;                                  TESTS BEING RUN ON EVERY OTHER MASTER CLEAR
                                ;
                                ;        EXIT CONDITIONS - 1. NO ERROR - DMR11 MICROPROCESSOR INITIALIZED
                                ;                          2. IF RUN BIT NOT SET BEFORE DELAY TIMEOUT, ERROR
                                ;                             WILL RESULT.  ADDITIONALLY THE ERROR MESSAGE WILL
                                ;                             RELAY THE RESULTS OF THE MICROTESTS IF THE RUN
                                ;                             BIT IS NOT SET.
                                ;
                                ;        NOTE:             THERE IS A PATCH AREA TO ALLOW THESE DIAGNOSTICS
                                ;                          TO RUN ON A M8206 (INSTEAD OF M8207).  THIS
                                ;                          SHOULD BE FOR DEVELOPMENT USE ONLY.
                                ;
                                ;    REGISTERS DESTROYED - RESTORED
                                ;
                                ;;*******************************************************************
                                ;;*******************************************************************
011066                          $MSCLR:
011066  011637  002372                  MOV     (SP),SUBRPC     ;SAVE PC AFTER THE CALL TO $WAIT.
011072  162737  000004  002372          SUB     #4,SUBRPC       ;BACKUP TO THE PC OF THE ACTUAL CALL
011100  010046                          MOV     R0,-(SP)        ;SAVE R0
011102  010146                          MOV     R1,-(SP)        ;SAVE R1

011104  105077  171134                  CLRB    @BSEL3          ;CLEAR BSEL3

011110  000240                          NOP                     ;*********************************
011112  000240                          NOP                     ;** PATCH AREA FOR 8206 IF NEEDED **
011114  000240                          NOP                     ;CLR @#SEL6  -
011116  000240                          NOP                     ;*********************************

011120  032737  000001  002376          BIT     #BIT0,CLRNO     ;IS THIS AN ODD MASTER CLEAR.
011126  001004                          BNE     7$              ;IF YES - BR
011130  012777  040000  171074          MOV     #MCLR,@SEL0     ;ISSUE A MASTER CLEAR.
011136  000403                          BR      8$
011140                          7$:
011140  012777  060000  171064          MOV     #MCLR!MDIAG,@SEL0 ;ISSUE THE MASTER CLEAR AND TOGGLE
                                                                ;MICRO TEST SWITCH.
011146                          8$:
011146  000240                          NOP                     ;*********************************
```

```
011150  000240                          NOP                     ;** PATCH AREA FOR 8206 IF NEEDED **
011152  000240                          NOP                     ;MOV #RUN,@#SEL0  -
011154  000240                          NOP                     ;**********************************

011156  005237  002376                  INC     CLKNO           ;INCR WORD (CHANGE ODD TO EVEN ETC.)
011162  013701  002314                  MOV     WAIT2,R1        ;GET THE # OF 100 MICRO SECOND DELAYS
                                                                ;TO WAIT BEFORE EXITING THE ROUTINE.
011166                          10$:
011166  005000                          CLR     R0              ;INNER LOOP COUNT
011170                          20$:
011170  032777  100000  171034          BIT     #RUN,@SEL0      ;IS THE RUN BIT SET IN SEL0?
011176  001025                          BNE     40$             ;YES - EXIT
011200                                  BREAK                   ;CALL SUPERVISOR - ALLOW CONSOLE INTERRUPT.
011200  104422                                                                          TRAP    C$BRK
011202  005300                          DEC     R0              ;LOOP UNTIL R0 RETURNS TO 0
011204  001371                          BNE     20$
011206                                  DELAY   1               ;DELAY 100 MICROSECONDS
011206  012727  000001                                                                  MOV     #1,(PC)+
011212  000000                                                                          .WORD   0
011214  013727  002116                                                                  MOV     L$DLY,(PC)+
011220  000000                                                                          .WORD   0
011222  005367  177772                                                                  DEC     -6(PC)
011226  001375                                                                          BNE     .-4
011230  005367  177756                                                                  DEC     -22(PC)
011234  001367                                                                          BNE     .-20
011236  005301                          DEC     R1              ;REPEAT UNTIL MAX LOOP SATISFIED.
011240  001352                          BNE     10$
011242                                  ERRDF   1,EMG1,ERRG3    ;REPORT RUN NOT SET
011242  104455                                                                          TRAP    C$ERDF
011244  000001                                                                          .WORD   1
011246  017704                                                                          .WORD   EMG1
011250  015226                                                                          .WORD   ERRG3
011252                          40$:
011252  012601                          MOV     (SP)+,R1        ;RESTORE R1
011254  012600                          MOV     (SP)+,R0        ;RESTORE R0
011256  005037  002372                  CLR     SUBRPC          ;TIDY UP SUBRPC
011262  000207                          RETURN
```

```
                                        ;;*****************************************************************
                                        ;;*****************************************************************
                                        ;
                                        ;                    SUBROUTINE $BASEI
                                        ;
                                        ;            FUNCTION -  TO PERFORM A BASE IN COMMAND
                                        ;
                                        ;      CALLING FORMAT:          JSR     PC,     $BASEI
                                        ;                               .WORD A (SEL0 MAINTENANCE BITS)
                                        ;                               .WORD B (SEL4 - ADDRESS)
                                        ;                               .WORD C (SEL6 - MODE AND/OR RESUME)
                                        ;                               (MACRO CALL -- BASEIN  OR  BASEIN A,B,C)
                                        ;
                                        ;      NESTING LEVEL     - MAY ONLY BE CALLED FROM IN-LINE CODE (TEST,
                                        ;                          SUBTEST OR TEST SEGMENT)
                                        ;
                                        ;      ENTRY CONDITIONS - A = MAINTENANCE BITS (I.E. LINE UNIT LOOP BACK)
                                        ;                         B = BASE TABLE ADDRESS (SEL4)
                                        ;                         C = MODE + RESUME (SEL6)
                                        ;                         INFACE = 0  - NO INTERFACE WRITE REQUIRED
                                        ;                                  1  - WRITE INTERFACE (AX3-15)
                                        ;
                                        ;       EXIT CONDITIONS - 1. IF NO ERROR - DMR11 BASE TABLE ASSIGNED
                                        ;                         2. IF IN DMR MODE, AND INTERFACE WRITE REQUESTED
                                        ;                            WRITE REQUESTED AX3-15.
                                        ;                         3. TIMEOUT ERRORS ARE DETECTED IN WAIT SUBROUTINES.
                                        ;                         DMRFLG = -1  DMR MODE REQUESTED (USED IN CONTROL IN
                                        ;                                      ROUTINE)
                                        ;                                   0  DMC MODE OR RESUME REQUESTED.
                                        ;
                                        ;
                                        ;    REGISTERS DESTROYED - RESTORED
                                        ;
                                        ;;*****************************************************************
                                        ;;*****************************************************************
011264                                  $BASEI:
011264  011637  002372                          MOV     (SP),SUBRPC     ;SAVE PC AFTER THE CALL TO $WAIT.
011270  162737  000004  002372                  SUB     #4,SUBRPC       ;BACKUP TO THE PC OF THE ACTUAL CALL

011276  112777  000043  170726                  MOVB    #RQI!BASEI,@BSEL0 ;ISSUE THE BASE IN COMMAND.
011304  012737  000001  002374                  MOV     #1,NESTPC       ;FLAG THAT THE NEXT SUBROUTINE IS NESTED.
011312                                          WAIT    RDI             ;WAIT FOR RDI
                                                                        ;**** MACRO EXPANSION ****
011312  004737  010274                          JSR     PC, $WAIT       ;CALL WAIT ROUTINE
011316  000000                                          .WORD   0       ;FLAG THAT WE'RE WAITING FOR RDI
                                                                        ;****                   ****
011320                                          BNERROR 10$             ;IF NO ERROR, RDI SET - PROCEED
011320  103003                                                                                  BCC     10$
011322  062716  000006                          ADD     #6,(SP)         ;CORRECT STACK FOR ERROR EXIT
011326  000467                                  BR      30$             ;EXIT
011330                                  10$:
011330  057677  000000  170674                  BIS     @(SP),@SEL0     ;SET ANY MAINTENANCE BITS
011336  062716  000002                          ADD     #2,(SP)         ;INC. POINTER.
011342  017677  000000  170666                  MOV     @(SP),@SEL4     ;SET UP BASE ADDRESS
011350  062716  000002                          ADD     #2,(SP)         ;INC. POINTER AGAIN
011354  017677  000000  170656                  MOV     @(SP),@SEL6     ;SET UP RESUME BIT AND THE HIGH 2 BITS
                                                                        ;OF THE BASE TABLE ADDRESS
```

```
011362  062716  000002                  ADD     #2,(SP)          ;INC. POINTER AGAIN (SHOULD BE AT RETURN PC)
011366                                  WAIT    RQI              ;CLEAR RQI AND WAIT FOR RDI TO CLEAR
                                                                 ;**** MACRO EXPANSION ****
011366  004737  010704                  JSR     PC, $CLRQI       ;CLEAR RQI AND WAIT FOR IT TO BE CLEARED.
                                                                 ;****                    ****
011372                                  BERROR  30$              ;IF ERROR, EXIT
011372  103445                                                                           BCS     30$
011374  122777  000122  170636          CMPB    #122,@BSEL6      ;WAS THIS A DMR BASE IN?
011402  001004                          BNE     15$              ;IF NOT, CLEAR DMR FLAG (DMC MODE)
011404  032777  010000  170626          BIT     #RES,@SEL6       ;IS THIS A RESUME?
011412  001403                          BEQ     16$              ;IF NOT, PROCEED
011414                          15$:
011414  005037  002260                  CLR     DMRFLG           ;CLEAR DMR FLAG (NO DMR RUN ACKNOWLEDGE).
011420  000432                          BR      30$              ;SKIP - TO END
011422                          16$:
011422  012737  177777  002260          MOV     #-1,DMRFLG       ;FLAG THAT DMR MODE WAS REQUESTED.
011430  005737  002262                  TST     INFACE           ;IS AN INTERFACE WRITE REQUIRED?
011434  001424                          BEQ     30$              ;IF NOT - SKIP TO END
011436  022737  000001  002364          CMP     #CNTRL.ERROR     ;ARE WE EXPECTING AN ERROR (IN TEST THAT
                                                                 ;FORCES AN ERROR)
011444  001004                          BNE     17$              ;IF NOT PROCEED
011446  032777  000200  170556          BIT     #RDO,@SEL0       ;IF EXPECTING AN ERROR - IS RDO SET
011454  001014                          BNE     30$              ;IF YES - DON'T BOTHER CHANGING THE INTERFACE.
011456                          17$:
011456  112777  000055  170546          MOVB    #RQI!INTER,@BSEL0 ;ISSUE WRITE INTERFACE COMMAND.
011464                                  WAIT    RDI              ;WAIT FOR RDI
                                                                 ;**** MACRO EXPANSION ****
011464  004737  010274                  JSR     PC, $WAIT        ;CALL WAIT ROUTINE
011470  000000                                  .WORD   0        ;FLAG THAT WE'RE WAITING FOR RDI
                                                                 ;****                    ****
011472                                  BERROR  30$              ;IF ERROR, BR TO END.
011472  103405                                                                           BCS     30$
011474  113777  002304  170546          MOVB    AX3,@BSEL7       ;WRITE AX3-15. INTERFACE SELECTED
                                                                 ;BY AX3 DETERMINED IN INIT. CODE.
011502                                  WAIT    RQI              ;CLEAR RQI AND WAIT FOR RDI TO CLEAR.
                                                                 ;**** MACRO EXPANSION ****
011502  004737  010704                  JSR     PC, $CLRQI       ;CLEAR RQI AND WAIT FOR IT TO BE CLEARED.
                                                                 ;****                    ****
011506                          30$:
011506  005037  002374                  CLR     NESTPC           ;CLEAR THE NEST FLAG
011512  005037  002372                  CLR     SUBPPC           ;TIDY UP SUBRPC
011516  000207                          RETURN
```

```
                                        ;;*****************************************************************
                                        ;;*****************************************************************
                                        ;
                                        ;                    SUBROUTINE $CNTIN
                                        ;
                                        ;            FUNCTION -  TO PERFORM A CONTROL IN COMMAND
                                        ;
                                        ;       CALLING FORMAT:         JSR     PC,     $CNTIN
                                        ;                               .WORD   A (SEL6 - MAINTENANCE MODE & HDX)
                                        ;                               (MACRO CALL -- CNTRIN  OR  CNTRIN A)
                                        ;
                                        ;       NESTING LEVEL     - MAY ONLY BE CALLED FROM IN-LINE CODE (TEST,
                                        ;                           SUBTEST OR TEST SEGMENT)
                                        ;
                                        ;       ENTRY CONDITIONS - DMRFLG = -1  EXPECT  CONTROL OUT IF IN DMR MODE
                                        ;                                 =  0  NO CONTROL OUT, IN DMC MODE OR RESUME.
                                        ;
                                        ;
                                        ;        EXIT CONDITIONS - 1. IF NO ERROR - DMR11 CONTROL IN PERFORMED
                                        ;                          2. TIMEOUTS REPORTED IN WAIT SUBROUTINES
                                        ;                          3. IF THIS IS A DMR MODE START UP CONTROL IN,
                                        ;                             THIS ROUTINE WILL WAIT FOR A CONTROL
                                        ;                             OUT - DMR RUN.  IF THIS CONTROL OUT IS
                                        ;                             NOT RECEIVED,  THIS WILL RESULT IN AN ERROR
                                        ;                             MESSAGE AND A REMINDER TO CHECK THE BAUD RATE,
                                        ;                             INTERFACE AND TURNAROUND (PROBABLE REASON).
                                        ;
                                        ;
                                        ;
                                        ;    REGISTERS DESTROYED
                                        ;
                                        ;;*****************************************************************
                                        ;;*****************************************************************
011520                                  $CNTIN:
011520  011637  002372                          MOV     (SP),SUBRPC     ;SAVE PC FROM WHERE THIS SUBR. WAS CALLED.
011524  162737  000004  002372                  SUB     #4,SUBRPC       ;BACKUP TO PC OF ACTUAL CALL
011532  112777  000041  170472                  MOVB    #RQI+CNTRL,@BSEL0 ;SET UP CONTROL IN COMMAND
011540  012737  000001  002374                  MOV     #1,NESTPC       ;FLAG THAT THE NEXT SUBROUTINE IS NESTED.
011546                                          WAIT    RDI             ;WAIT FOR SETTING OF RDI
                                                                        ;**** MACRO EXPANSION ****
011546  004737  010274                          JSR     PC, $WAIT       ;CALL WAIT ROUTINE
011552  000000                                          .WORD   0       ;FLAG THAT WE'RE WAITING FOR RDI
                                                                        ;****                   ****
011554                                          BNERROR 1$              ;IF NO ERROR - PROCEED
011554  103003                                                                                          BCC     1$
011556  062716  000002                          ADD     #2,(SP)         ;CORRECT RETURN ADDRESS
011562  000463                                  BR      20$             ;ERROR - EXIT
011564                                  1$:
011564  017677  000000  170446                  MOV     @(SP),@SEL6     ;SET MODE DESIRED
011572  062716  000002                          ADD     #2,(SP)         ;INC. RETURN PC LEFT ON STACK.
011576  032777  000400  170434                  BIT     #MAINT,@SEL6    ;WAS MAINTENANCE MODE REQUESTED?
011604  001402                                  BEQ     5$              ;IF NOT, LEAVE DMRFLG AS IS.
011606  005037  002260                          CLR     DMRFLG          ;CLEAR FLAG - NO RUN MODE CONTROL OUT.
011612                                  5$:
011612                                          WAIT    RQI             ;CLEAR RQI AND WAIT FOR RDI TO CLEAR
                                                                        ;**** MACRO EXPANSION ****
011612  004737  010704                          JSR     PC, $CLRQI      ;CLEAR RQI AND WAIT FOR IT TO BE CLEARED.
```

```
                                                                ;****                    ****
 51 011616  005737  002260                  TST     DMRFLG       ;WAS DMR MODE REQUESTED ON BASE IN?
 52 011622  001443                          BEQ     20$          ;BR IF NOT (DMC MODE)
 53 011624  005037  002260                  CLR     DMRFLG       ;CLEAR DMR RUN MODE FLAG
 54 011630                                  WAIT    RDO          ;EXPECT RDO TO BE SET
                                                                 ;**** MACRO EXPANSION ****
    011630  004737  010274                  JSR     PC, $WAIT    ;CALL WAIT ROUTINE
    011634  000001                                  .WORD   1    ;FLAG THAT WE'RE WAITING FOR RDO
                                                                 ;****                    ****
 55 011636                                  BNERROR 7$           ;IF NO ERROR - PROCEED
    011636  103011                                                                          BCC     7$
 56 011640                                  PRINTB  #FMS3        ;PRINT RUN ACKNOWLEDGE NOT RECEIVED.
    011640  012746  011744                                                                  MOV     #FMS3,-(SP)
    011644  012746  000001                                                                  MOV     #1,-(SP)
    011650  010600                                                                          MOV     SP,R0
    011652  104414                                                                          TRAP    C$PNTB
    011654  062706  000004                                                                  ADD     #4,SP
 57 011660  000421                          BR      15$
 58 011662                          7$:
 59 011662  032777  000001  170344          BIT     #CNTRL,@SEL2 ;DID WE RECEIVE A CONTROL OUT?
 60 011670  001005                          BNE     10$          ;IF YES - PROCEED.
 61 011672                                  ERRDF   8,EMG8,ERRG2 ;EXPECTED CONTROL OUT NOT RECEIVED.
    011672  104455                                                                          TRAP    C$ERDF
    011674  000010                                                                          .WORD   8
    011676  017762                                                                          .WORD   EMG8
    011700  015112                                                                          .WORD   ERRG2
 62 011702  000410                          BR      15$
 63 011704                          10$:
 64 011704  032777  000040  170326          BIT     #DMRRUN,@SEL6 ;WAS THE DMR RUN MODE BIT SET?
 65 011712  001004                          BNE     15$          ;BR IF OK.
 66 011714                                  ERRDF   9,EMG9,ERRG2 ;WRONG CONTROL OUT RECEIVED.
    011714  104455                                                                          TRAP    C$ERDF
    011716  000011                                                                          .WORD   9
    011720  020026                                                                          .WORD   EMG9
    011722  015112                                                                          .WORD   ERRG2
 67
 68 011724                          15$:
 69 011724  042777  000207  170302          BIC     #RDO!CMD,@SEL2 ;CLEAR RDO AND THE COMMAND BITS
 70 011732                          20$:
 71 011732  005037  002374                  CLR     NESTPC       ;CLEAR THE NEST FLAG
 72 011736  005037  002372                  CLR     SUBRPC       ;CLEAR PC
 73 011742  000207                          RETURN
 74
 75 011744     045     101     104  FMS3:  .ASCII  /%ADMR RUN ACKNOWLEDGE NOT RCVD.%N/
    011747     115     122     040
    011752     122     125     116
    011755     040     101     103
    011760     113     116     117
    011763     127     114     105
    011766     104     107     105
    011771     040     116     117
    011774     124     040     122
    011777     103     126     104
    012002     056     045     116
 76 012005     045     101     050          .ASCIZ  /%A(CHECK INTERFACE, BAUD AND TURNAROUND)%N/
    012010     103     110     105
    012013     103     113     040
```

```
        012016     111     116     124
        012021     105     122     106
        012024     101     103     105
        012027     054     040     102
        012032     101     125     104
        012035     040     101     116
        012040     104     040     124
        012043     125     122     116
        012046     101     122     117
        012051     125     116     104
        012054     051     045     116
        012057     000
    77                                          .EVEN
    78
    79
```

```
                                ;;*****************************************************************
                                ;;*****************************************************************
                                ;
                                ;                    SUBROUTINE $DMRIN
                                ;
                                ;            FUNCTION -  TO PERFORM A DMR MODE INPUT COMMAND
                                ;
                                ;       CALLING FORMAT:          JSR     PC,     $DMRIN
                                ;                                .WORD   COMMAND
                                ;                                .WORD   B
                                ;                                .WORD   C
                                ;                                (MACRO CALL -- DMRIN A,B,C)
                                ;
                                ;       NESTING LEVEL     - MAY BE CALLED FROM IN-LINE CODE (TEST,
                                ;                           SUBTEST OR TEST SEGMENT) OR FROM THE $LOOP
                                ;                           SUBROUTINE
                                ;
                                ;       ENTRY CONDITIONS - MUST BE IN DMR MODE
                                ;                          FOR ALL COMMANDS EXCEPT WRITE MODEM
                                ;                               B = SEL4
                                ;                               C = SEL6
                                ;                          FOR MODEM WRITE
                                ;                               B = BITS TO CLEAR IN SEL6
                                ;                               C = BITS TO SET IN SEL6
                                ;                          NESTPC = 1 - SUBROUTINE NESTED WITHIN ANOTHER SUB.
                                ;                                 = 0 - SUBROUTINE NOT NESTED.
                                ;
                                ;        EXIT CONDITIONS - IF NO ERROR - DMR11 MODE INPUT COMMAND PERFORMED.
                                ;
                                ;
                                ;    REGISTERS DESTROYED
                                ;
                                ;;*****************************************************************
                                ;;*****************************************************************
012060                          $DMRIN:
012060  005737  002374                  TST     NESTPC          ;IS THIS SUBROUTINE NESTED?
012064  001005                          BNE     1$              ;IF YES - DON'T CHANGE  SUBRPC.
012066  011637  002372                  MOV     (SP),SUBRPC     ;SAVE PC FROM WHERE THIS SUBR. WAS CALLED.
012072  162737  000004  002372          SUB     #4,SUBRPC       ;BACKUP TO PC OF ACTUAL CALL
012100                          1$:
012100  117637  000000  002340          MOVB    @(SP),SAVE      ;SAVE DMR INPUT COMMAND
012106  117677  000000  170116          MOVB    @(SP),@BSEL0    ;SET UP DMR INPUT COMMAND.
012114  062716  000002                  ADD     #2,(SP)         ;INC RETURN PC LEFT ON STACK.
012120  052777  000040  170104          BIS     #RQI,@SEL0      ;REQUEST INPUT.
012126  013746  002374                  MOV     NESTPC,-(SP)    ;SAVE THE CURRENT NEST FLAG.
012132  012737  000001  002374          MOV     #1,NESTPC       ;USE THE FLAG TO SHOW THE WAIT
                                                                ;ROUTINE IS NESTED.
012140                                  WAIT    RDI             ;WAIT FOR SETTING OF RDI
                                                                ;**** MACRO EXPANSION ****
012140  004737  010274                  JSR     PC, $WAIT       ;CALL WAIT ROUTINE
012144  000000                                  .WORD   0       ;FLAG THAT WE'RE WAITING FOR RDI
                                                                ;****                   ****
012146  012637  002374                  MOV     (SP)+,NESTPC    ;RESTORE THE ORIGINAL NEST FLAG.
012152                                  BNERROR 5$              ;IF NO ERROR, OK - PROCEED.
012152  103003                                                                          BCC     5$
012154  062716  000004                  ADD     #4,(SP)         ;UPDATE RETURN ADDRESS.
012160  000433                          BR      10$             ;ERROR EXIT.
```

```
012162                          5$:
012162  122737  000005  002340          CMPB    #WMODEM,SAVE    ;IS THIS A MODEM WRITE?
012170  001413                          BEQ     6$              ;IF YES - SET/CLEAR BITS.
012172  017677  000000  170036          MOV     @(SP),@SEL4     ;PASS VALUE FOR SEL4 (VALUE, IF ANY,
                                                                ;DEPENDS ON THE DMR COMMAND)
012200  062716  000002                  ADD     #2,(SP)         ;INC. RETURN PC LEFT ON STACK.
012204  017677  000000  170026          MOV     @(SP),@SEL6     ;PASS VALUE FOR SEL6 (VALUE, IF ANY,
                                                                ;DEPENDS ON THE DMR COMMAND)
012212  062716  000002                  ADD     #2,(SP)         ;INC. RETURN PC LEFT ON STACK.
012216  000412                          BR      7$
012220                          6$:
012220  047677  000000  170012          BIC     @(SP),@SEL6     ;CLEAR MODEM BITS
012226  062716  000002                  ADD     #2,(SP)         ;INC. RETURN PC LEFT ON STACK
012232  057677  000000  170000          BIS     @(SP),@SEL6     ;SET MODEM BITS
012240  062716  000002                  ADD     #2,(SP)         ;INC. RETURN PC LEFT ON STACK.
012244                          7$:
012244                                  WAIT    RQI             ;CLEAR RQI AND WAIT FOR RDI TO CLEAR
                                                                ;**** MACRO EXPANSION ****
012244  004737  010704                  JSR     PC, $CLRQI      ;CLEAR RQI AND WAIT FOR IT TO BE CLEARED.
                                                                ;****                   ****
012250                          10$:
012250  005737  002374                  TST     NESTPC          ;WAS THIS ROUTINE NESTED?
012254  001002                          BNE     15$             ;BR IF YES
012256  005037  002372                  CLR     SUBRPC          ;CLEAR PC
012262                          15$:
012262  005037  002340                  CLR     SAVE            ;RESTORE TEMP VALUE
012266  000207                          RETURN
```

```
                                        ;;*****************************************************************
                                        ;;*****************************************************************
                                        ;
                                        ;                    SUBROUTINE $BACC
                                        ;
                                        ;            FUNCTION -  TO PERFORM A BUFFER ADDRESS/CHARACTER
                                        ;                        COUNT IN COMMAND
                                        ;
                                        ;     CALLING FORMAT:          JSR     PC,      $BACC
                                        ;                              .WORD   SEL0     ;BA/CC IN COMMAND
                                        ;                              .WORD   SEL4     ;BUFFER ADDRESS
                                        ;                              .WORD   SEL6     ;BA BITS 16 & 17 AND
                                        ;                                               ;CHARACTER COUNT
                                        ;                              (MACRO CALL -- BACCIT  OR  BACCIT A,B)
                                        ;                           OR (MACRO CALL -- BACCIR  OR  BACCIR A,B)
                                        ;
                                        ;     NESTING LEVEL     - MAY ONLY BE CALLED FROM IN-LINE CODE (TEST,
                                        ;                         SUBTEST OR TEST SEGMENT)
                                        ;
                                        ;     ENTRY CONDITIONS -
                                        ;
                                        ;      EXIT CONDITIONS - IF NO ERROR - DMR11 BA/CC COMMAND IN PERFORMED
                                        ;
                                        ;
                                        ;   REGISTERS DESTROYED - NOT AFFECTED
                                        ;
                                        ;;*****************************************************************
                                        ;;*****************************************************************
012270                                  $BACC:
012270  011637  002372                          MOV     (SP),SUBRPC     ;SAVE PC FROM WHERE THIS SUBR. WAS CALLED.
012274  162737  000004  002372                  SUB     #4,SUBRPC       ;BACKUP TO PC OF ACTUAL CALL
012302  117677  000000  167722                  MOVB    @(SP),@BSEL0    ;SET UP BA/CC COMMAND IN (TRANSMIT OR RECEIVE)
012310  062716  000002                          ADD     #2,(SP)         ;INC POINTER ON STACK
012314  012737  000001  002374                  MOV     #1,NESTPC       ;FLAG THAT THE NEXT SUBROUTINE IS NESTED.
012322                                          WAIT    RDI             ;WAIT FOR SETTING OF RDI
                                                                        ;**** MACRO EXPANSION ****
012322  004737  010274                          JSR     PC, $WAIT       ;CALL WAIT ROUTINE
012326  000000                                          .WORD   0       ;FLAG THAT WE'RE WAITING FOR RDI
                                                                        ;****                   ****
012330                                          BNERROR 10$             ;IF NO ERROR - PROCEED
012330  103003                                                                                  BCC     10$
012332  062716  000004                          ADD     #4,(SP)         ;CORRECT STACK FOR ERROR EXIT.
012336  000414                                  BR      20$             ;EXIT
012340                                  10$:
012340  017677  000000  167670                  MOV     @(SP),@SEL4     ;SET BUFFER ADDRESS
012346  062716  000002                          ADD     #2,(SP)         ;INC POINTER ON STACK
012352  017677  000000  167660                  MOV     @(SP),@SEL6     ;SET UP BUFFER COUNT AND BUFFER ADDRESS
                                                                        ;BITS 16 & 17
012360  062716  000002                          ADD     #2,(SP)         ;INC POINTER ON STACK
012364                                          WAIT    RQI             ;CLEAR RQI AND WAIT FOR RDI TO CLEAR
                                                                        ;**** MACRO EXPANSION ****
012364  004737  010704                          JSR     PC, $CLRQI      ;CLEAR RQI AND WAIT FOR IT TO BE CLEARED.
                                                                        ;****                   ****
012370                                  20$:
012370  005037  002374                          CLR     NESTPC          ;CLEAR THE NEST FLAG
012374  005037  002372                          CLR     SUBRPC          ;CLEAR PC
012400  000207                                  RETURN
```

```
                                ;;*******************************************************************
                                ;;*******************************************************************
                                ;
                                ;                    SUBROUTINE $ERROR
                                ;
                                ;            FUNCTION -  TO CHECK THE FIRST 8. BASE TABLE ERROR COUNTS
                                ;                        FOR NON-ZERO VALUES.
                                ;
                                ;      CALLING FORMAT:         JSR     PC,     $ERROR
                                ;
                                ;      NESTING LEVEL    - CAN BE NESTED WITHIN ANOTHER ROUTINE
                                ;
                                ;      ENTRY CONDITIONS - SHOULD BE DONE AFTER PROPER SHUTDOWN
                                ;                         NESTPC = 1 - SUBROUTINE NESTED WITHIN ANOTHER SUB.
                                ;                                = 0 - SUBROUTINE NOT NESTED.
                                ;
                                ;       EXIT CONDITIONS - IF ANY NON-ZERO VALUE FOUND IN THE BASE TABLE A
                                ;                         SOFT ERROR IS DECLARED.
                                ;
                                ;
                                ;   REGISTERS DESTROYED - RESTORED
                                ;
                                ;;*******************************************************************
                                ;;*******************************************************************
012402                          $ERROR:
012402  005737  002374                  TST     NESTPC          ;IS THIS ROUTINE NESTED?
012406  001005                          BNE     10$             ;BR IF YES (PC ALREADY SAVED)
012410  011637  002372                  MOV     (SP),SUBRPC     ;SAVE PC AFTER THE CALL TO $WAIT.
012414  162737  000004  002372          SUB     #4,SUBRPC       ;BACKUP TO THE PC OF THE ACTUAL CALL
                                                                ;THE INSTRUCTION AFTER THE CALL.
012422                          10$:
012422  010046                          MOV     R0,-(SP)        ;SAVE R0
012424  010146                          MOV     R1,-(SP)        ;SAVE R1
012426  012700  002641                  MOV     #BASE+3,R0      ;POINTER TO ACTUAL BASE TABLE COUNTS.
012432  012701  000006                  MOV     #6.,R1          ;CHECK THE 6 NAK BYTES IN THE TABLE
012436                          20$:
012436  105720                          TSTB    (R0)+           ;IS THE NAK COUNT NON-ZERO?
012440  001016                          BNE     30$             ;IF YES - REPORT SOFT ERROR
012442  005301                          DEC     R1              ;LOOP UNTIL DONE.
012444  001374                          BNE     20$
012446  122010                          CMPB    (R0)+,(R0)      ;ARE THE REPS THE SAME?
012450  001012                          BNE     30$             ;IF NOT - REPORT ERROR.
012452  022737  000022  002114          CMP     #18.,L$TEST     ;IS THIS TEST 18 (LARGE BUFFER TEST)
012460  001403                          BEQ     25$             ;IF YES - ALLOW 1 REP
012462  105710                          TSTB    (R0)            ;IF NOT TEST 18 - REPORT IF NON ZERO.
012464  001004                          BNE     30$
012466  000407                          BR      40$             ;IF ZERO - OK.
012470                          25$:
012470  122710  000001                  CMPB    #1,(R0)         ;IS THE REP 0 OR 1?
012474  002004                          BGE     40$             ;IF YES - OK (WE ALLOW 1 REP BECAUSE
                                                                ;IN TEST 18 AT LOW BAUD RATES 1 REP IS
                                                                ;EXPECTED.)
012476                          30$:
012476                                  ERRSOFT 5,EMS3,ERRG4    ;REPORT SOFT ERROR
012476  104457                                                                  TRAP    C$ERSOFT
012500  000005                                                                  .WORD   5
012502  012526                                                                  .WORD   EMS3
```

```
        012504  015456                                                                  .WORD   ERRG4
     55 012506                          40$:
     56 012506  005737  002374                  TST     NESTPC          ;IS THE ROUTINE NESTED?
     57 012512  001002                          BNE     45$             ;BR IF YES
     58 012514  005037  002372                  CLR     SUBRPC          ;CLEAR SAVED PC
     59 012520                          45$:
     60 012520  012601                          MOV     (SP)+,R1        ;RESTORE R1
     61 012522  012600                          MOV     (SP)+,R0        ;RESTORE R0
     62 012524  000207                          RETURN
     63
     64 012526     102     101     123  EMS3:   .ASCIZ  /BASE TABLE ERRORS/
        012531     105     040     124
        012534     101     102     114
        012537     105     040     105
        012542     122     122     117
        012545     122     123     000
     65                                         .EVEN
     66
```

```
                                        ;;*******************************************************************
                                        ;;*******************************************************************
                                        ;
                                        ;                    SUBROUTINE $HALT
                                        ;
                                        ;            FUNCTION - TO SHUTDOWN THE DMR11
                                        ;
                                        ;      ENTRY CONDITIONS - NONE
                                        ;
                                        ;      EXIT CONDITIONS  - DMR SHUTDOWN
                                        ;
                                        ;      REGISTERS        - NO EFFECT
                                        ;
                                        ;
                                        ;;*******************************************************************
                                        ;;*******************************************************************
012550                                  $HALT:
012550  011637  002372                          MOV     (SP),SUBRPC     ;SAVE THE PC WHEN THE SUBROUTINE WAS CALLED.
012554  162737  000004  002372                  SUB     #4,SUBRPC       ;BACK UP TO THE ADDRESS OF THE ACTUAL CALL.
012562  112777  000042  167442                  MOVB    #RQI!HLT,@SEL0  ;ISSUE A HALT
012570  105077  167440                          CLRB    @SEL2           ;CLEAR ANY OUTPUT PENDING
012574  012737  000001  002374                  MOV     #1,NESTPC       ;FLAG THAT THE NEXT SUBROUTINE IS NESTED.
012602                                          WAIT    RDI             ;WAIT FOR RDI
                                                                        ;**** MACRO EXPANSION ****
012602  004737  010274                          JSR     PC, $WAIT       ;CALL WAIT ROUTINE
012606  000000                                          .WORD   0       ;FLAG THAT WE'RE WAITING FOR RDI
                                                                        ;****                   ****
012610                                          BERROR  20$             ;IF ERROR, EXIT
012610  103430                                                                                  BCS     20$
012612                                          WAIT    RQI             ;CLEAR RQI AND WAIT FOR RDI TO CLEAR
                                                                        ;**** MACRO EXPANSION ****
012612  004737  010704                          JSR     PC, $CLRQI      ;CLEAR RQI AND WAIT FOR IT TO BE CLEARED.
                                                                        ;****                   ****
012616                                          BERROR  20$             ;IF ERROR, EXIT
012616  103425                                                                                  BCS     20$
012620                                          WAIT    RDO             ;WAIT FOR RDO
                                                                        ;**** MACRO EXPANSION ****
012620  004737  010274                          JSR     PC, $WAIT       ;CALL WAIT ROUTINE
012624  000001                                          .WORD   1       ;FLAG THAT WE'RE WAITING FOR RDO
                                                                        ;****                   ****
012626                                          BERROR  20$             ;IF ERROR, EXIT
012626  103421                                                                                  BCS     20$
012630  032777  000001  167376                  BIT     #CNTRL,@SEL2    ;IS THIS A CONTROL OUT?
012636  001005                                  BNE     10$             ;IF YES - PROCEED
012640                                          ERRDF   4,EMS4,ERRG2    ;ERROR
012640  104455                                                                                  TRAP    C$ERDF
012642  000004                                                                                  .WORD   4
012644  012712                                                                                  .WORD   EMS4
012646  015112                                                                                  .WORD   ERRG2
012650  000410                                  BR      20$
012652                                  10$:
012652  032777  001000  167360                  BIT     #HALTC,@SEL6    ;IS THE DMR HALTED?
012660  001004                                  BNE     20$             ;IF YES - EXIT
012662                                          ERRDF   4,EMS4,ERRG2    ;ERROR - NOT EXPECTED CONTROL OUT.
012662  104455                                                                                  TRAP    C$ERDF
012664  000004                                                                                  .WORD   4
012666  012712                                                                                  .WORD   EMS4
```

```
        012670  015112                                                                                    .WORD   ERRG2
     37 012672                          20$:
     38 012672  042777  000207  167334          BIC     #RDO!CMD,@SEL2  ;CLEAR RDO AND COMMAND BITS.
     39 012700  005037  002374                  CLR     NESTPC          ;CLEAR THE NEST FLAG
     40 012704  005037  002372                  CLR     SUBRPC          ;CLEAR THE PC.
     41 012710  000207                          RETURN
     42
     43 012712     123     110     125  EMS4:   .ASCIZ  /SHUTDOWN ERROR/
        012715     124     104     117
        012720     127     116     040
        012723     105     122     122
        012726     117     122     000
     44                                         .EVEN
```

```
                                        ;;*****************************************************************
                                        ;;*****************************************************************
                                        ;
                                        ;                    SUBROUTINE $ROMO
                                        ;
                                        ;            FUNCTION - TO READ THE CONTENTS OF THE ROM
                                        ;
                                        ;      ENTRY CONDITIONS - ROMADR =  ROM ADDRESS
                                        ;
                                        ;      EXIT CONDITIONS  - BSEL6  =  CONTENTS OF ROM ADDRESS
                                        ;
                                        ;      REGISTERS        - NO EFFECT
                                        ;
                                        ;
                                        ;;*****************************************************************
                                        ;;*****************************************************************
012732                                  $ROMO:
012732  005077  167274                          CLR     @SEL0           ;INIT
012736  113777  002411  167270                  MOVB    ROMADR+1,@SEL2  ;SET HIGH BYTE OF ROM ADDRESS
012744  052777  001000  167260                  BIS     #ROMI,@SEL0     ;ENABLE SEL6 TO BE USED AS MAINTENANCE REG.
012752  012777  121053  167260                  MOV     #121053,@SEL6   ;SET UP MICROINSTRUCTION TO
                                                                        ;MOVE IBUS* 2 TO OBUS* 13
                                                                        ;(OBUS* 13 IS A SHADOW REGISTER FOR
                                                                        ;BITS 8-11 OF THE PC)
012760  052777  000400  167244                  BIS     #STUP,@SEL0     ;CLOCK THE INSTRUCTION
012766  042777  001400  167236                  BIC     #ROMI!STUP,@SEL0 ;CLEAR
012774  042737  000377  013050                  BIC     #377,1$         ;CLEAR ADDRESS FIELD OF BRANCH INST.
013002  153737  002410  013050                  BISB    ROMADR,1$       ;ADD ADDRESS OF BRANCH.
013010  052777  001000  167214                  BIS     #ROMI,@SEL0     ;ENABLE SEL6
013016  013777  013050  167214                  MOV     1$,@SEL6        ;SET UP MICROINSTRUCTION TO
                                                                        ;BRANCH IMMEDIATELY TO PC.  BRANCH IS
                                                                        ;NECESSARY TO TRANSFER PC SHADOW REG TO PC
013024  052777  000400  167200                  BIS     #STUP,@SEL0     ;CLOCK THE INSTRUCTION
                                                                        ;ROM PC = ROM ADDRESS
013032  042777  001400  167172                  BIC     #ROMI!STUP,@SEL0 ;CLEAR
013040  052777  002000  167164                  BIS     #ROMO,@SEL0     ;CLOCK IN A MAINTENANCE ROM OUT
                                                                        ;ROM CONTENTS ARE NOW IN SEL6.
013046  000207                                  RETURN

013050  100000                          1$:     .WORD   100000          ;MICRO INSTRUCTION OPCODE FOR IMMEDIATE
                                                                        ;BRANCH (ROM ADDRESS IS ADDED INTO BITS 0-7)
```

```
                                        ;;*******************************************************************
                                        ;;*******************************************************************
                                        ;
                                        ;                    SUBROUTINE $LOOP
                                        ;
                                        ;            FUNCTION - TO ISSUE AN EXTENDED CONTROL IN TO SET
                                        ;                       UP THE MODEM LOOPBACK DESIRED BY THE USER.
                                        ;
                                        ;       ENTRY CONDITIONS -  WMAINT = 0 - DON'T WRITE MAINT. BITS
                                        ;                           WMAINT = 1 - SET BITS
                                        ;                                    (WMAINT SET IN INIT CODE)
                                        ;                           DMCMDE = 0 - DMR MODE
                                        ;                           DMTURN = TURN AROUND CONNECTOR
                                        ;
                                        ;       EXIT CONDITIONS  -
                                        ;
                                        ;       REGISTERS        -  NOT DESTROYED
                                        ;
                                        ;
                                        ;;*******************************************************************
                                        ;;*******************************************************************
013052                                  $LOOP:
013052  005737  002276                          TST     DMCMDE          ;IS THE DMR IN DMC MODE?
013056  001041                                  BNE     30$             ;IF SO, EXIT (CAN'T DO DMR MODE INPUT)
013060  005737  002306                          TST     WMAINT          ;DO WE NEED TO WRITE THE MAINTENANCE BITS?
013064  001436                                  BEQ     30$             ;IF NOT - EXIT.
013066  011637  002372                          MOV     (SP),SUBRPC     ;SAVE THE PC AFTER THE CALL TO $LOOP
013072  162737  000004  002372                  SUB     #4,SUBRPC       ;BACKUP TO THE PC OF THE ACTUAL CALL.
013100  022737  000006  002254                  CMP     #LLOOP,DMTURN   ;IS LOCAL MODEM LOOPBACK DESIRED?
013106  001007                                  BNE     10$             ;IF NOT - PROCEED.
013110  012737  000004  013156                  MOV     #MAINT2,100$    ;ENSURE REMOTE LOOPBACK IS CLEAR.
013116  012737  000010  013160                  MOV     #MAINT1,101$    ;SET MAINT BIT FOR LOCAL LOOPBACK
013124  000406                                  BR      20$
013126                                  10$:
                                                                        ;IN ALL OTHER LOOPBACK CONFIGURATIONS
                                                                        ;SET MAINTENANCE 2 (CONFIG. TYPE 1,3,7)
013126  012737  000010  013156                  MOV     #MAINT1,100$    ;ENSURE REMOTE LOOPBACK IS CLEAR.
013134  012737  000004  013160                  MOV     #MAINT2,101$    ;SET MAINT BIT FOR REMOTE LOOPBACK
013142                                  20$:
013142  012737  000001  002374                  MOV     #1,NESTPC       ;FLAG THAT THE NEXT SUBROUTINE IS NESTED.
013150                                          CALL    $DMRIN          ;DMR MODE INPUT COMMAND
013154  000005                                          .WORD   WMODEM  ;WRITE MODEM COMMAND
013156  000000                          100$:           .WORD   0       ;BITS TO CLEAR IN MODEM REGISTER
013160  000000                          101$:           .WORD   0       ;BITS TO SET IN MODEM REGISTER

013162                                  30$:
013162  005037  002374                          CLR     NESTPC          ;CLEAR THE NEST FLAG
013166  005037  002372                          CLR     SUBRPC          ;CLEAR PC.
013172  000207                                  RETURN
```

```
                                        ;;*******************************************************************
                                        ;;*******************************************************************
                                        ;
                                        ;                    SUBROUTINE $BUFFS
                                        ;
                                        ;          FUNCTION - TO DETERMINE BUFFERS FOR TEST 15 - 19.  THIS
                                        ;                     SUBROUTINE WILL USE ONE OF THE FOLLOWING
                                        ;                     THREE BUFFER AREAS:
                                        ;                          1. IF MEMORY MANAGED, 32K - 48K
                                        ;                          2. FREE MEMORY, IF MORE THAN 4K BYTES.
                                        ;                          3. IF 2 OR 3 NOT POSSIBLE, DEFAULT 4K
                                        ;                             DEFAULT BUFFER WITHIN THIS DIAGNOSTIC.
                                        ;
                                        ;       CALL             - JSR  PC,$BUFFS
                                        ;
                                        ;       NESTING LEVEL    - CALLED ONLY BY TESTS  16-20
                                        ;
                                        ;       ENTRY CONDITIONS - BUFNUM = # OF RCV & XMIT BUFFERS
                                        ;
                                        ;       EXIT CONDITIONS  - MMANAG = 1   MEMORY MANAGEMENT USED
                                        ;                          MMANAG = 0   MEMORY MANAGEMENT NOT USED
                                        ;                          RCVBUF    =  ADDRESS OF RECEIVE BUFFER (VIRTUAL)
                                        ;                          RCVBUF+2  =  CHARACTER COUNT
                                        ;                          RCVBUF+4  =  ADDRESS OF NEXT RECEIVE BUFFER
                                        ;                               (UP TO 64 ADDRESSES AND COUNTS)
                                        ;                          XMTBUF    =  ADDRESS OF TRANSMIT BUFFER (VIRTUAL)
                                        ;                               (UP TO 64 ADDRESSES AND COUNTS)
                                        ;
                                        ;       REGISTERS        - NOT DESTROYED
                                        ;
                                        ;
                                        ;;*******************************************************************
                                        ;;*******************************************************************
 013174                                 $BUFFS:
 013174  011637  002372                         MOV     (SP),SUBRPC      ;SAVE PC AFTER THE CALL TO $BUFFS
 013200  162737  000004  002372                 SUB     #4,SUBRPC        ;BACKUP TO THE PC OF THE CALL.
 013206  005037  002350                         CLR     NXMFLG
 013212                                         SETVEC  #4,#NOXMEM,#PRI07 ;SET UP TRAP 4 (WILL SET FLAG FOR NXM)
 013212  012746  000340                                                                   MOV     #PRI07,-(SP)
 013216  012746  023572                                                                   MOV     #NOXMEM,-(SP)
 013222  012746  000004                                                                   MOV     #4,-(SP)
 013226  012746  000003                                                                   MOV     #3,-(SP)
 013232  104437                                                                           TRAP    C$SVEC
 013234  062706  000010                                                                   ADD     #10,SP
 013240  005737  177572                         TST     @#177572         ;ADDRESS MEMORY MANAGEMENT REG
 013244  005737  002350                         TST     NXMFLG           ;IS THE FLAG STILL CLEARED?
                                                                         ;NOTE: THE FLAG WILL BE SET BY THE TRAP
                                                                         ;IF THERE IS NO MEMORY MANAGEMENT.
 013250  001143                                 BNE     30$              ;BR TO USE NON-MEMORY MANAG. BUFFERS.
 013252  023727  002120  003000                 CMP     L$HIMEM,#3000    ;IS THERE AT LEAST 48K WORDS? (16K WORDS
                                                                         ;FOR BUFFERS)
 013260  002537                                 BLT     30$              ;IF NOT, USE NON-MEMORY MANAG. BUFFERS.
 013262  012737  000001  002302                 MOV     #1,MMANAG        ;FLAG THAT MEMORY MANAGEMENT IS USED
 013270                                         SETPRI  #PRI07           ;MAKE SURE WE ARE IN KERNEL MODE.
 013270  012700  000340                                                                   MOV     #PRI07,R0
 013274  104441                                                                           TRAP    C$SPRI
                                                                         ;SETTING PRI SHOULD SHOULD ALSO CLEAR
```

```
                                                                        ;BITS 14 & 15
013276  012701  172300                  MOV     #172300,R1              ;GET ADDRESS OF KERNEL PDR REG 0.
013302  012700  000010                  MOV     #8.,R0                  ;WRITE PDR REG 0-7.
013306                          10$:
013306  012721  077406                  MOV     #77406,(R1)+            ;WRITE BITS FOR THE FOLLOWING PAGE DESCRIPTION
                                                                        ;READ/WRITE ACCESS, 128. BLOCK PAGE LENGTH.
013312  005300                          DEC     R0                      ;WRITE ALL PDRS.
013314  001374                          BNE     10$
013316  012701  172340                  MOV     #172340,R1              ;ADDRESS OF KERNEL PAR 0
013322  005011                          CLR     (R1)                    ;PAR 0, ADDRS      0 -  17776
013324  012761  000200  000002          MOV     #200,2(R1)              ;PAR 1, ADDRS  20000 -  37776
013332  012761  000400  000004          MOV     #400,4(R1)              ;PAR 2, ADDRS  40000 -  57776
013340  012761  002000  000006          MOV     #2000,6(R1)             ;PAR 3, ADDRS 200000 - 217776 (BUFFER PAGE 1)
013346  012761  002200  000010          MOV     #2200,10(R1)            ;PAR 4, ADDRS 220000 - 237776 (BUFFER PAGE 2)
013354  012761  002400  000012          MOV     #2400,12(R1)            ;PAR 5, ADDRS 240000 - 257776 (BUFFER PAGE 3)
013362  012761  002600  000014          MOV     #2600,14(R1)            ;PAR 6, ADDRS 260000 - 277776 (BUFFER PAGE 4)
013370  012761  007600  000016          MOV     #7600,16(R1)            ;PAR 7, ADDRS 160000 - 677776 (I/O PAGE)

013376  012703  000400                  MOV     #256.,R3                ;COUNTER FOR OUTER  LOOP OF TEST PATTERN
013402  012704  060000                  MOV     #60000,R4               ;USE VIRTUAL ADDRESS TO MAP TO PAR 5
                                                                        ;GENERATE A TEST PATTERN IN THE 1ST 8K WORDS
                                                                        ;VIRTUAL ADDRESS 60000 - 111776
013406  012737  000001  177572          MOV     #1,@#177572             ;ENABLE MEMORY MANAGEMENT
013414                          15$:
013414  012701  000040                  MOV     #32.,R1                 ;COUNTER FOR INNER LOOP OF TEST PATTERN
013420  012702  002416                  MOV     #$CCITT,R2              ;ADDRESS FOR 32. WORD TEST PATTERN.
013424                          16$:
013424  012224                          MOV     (R2)+,(R4)+             ;WRITE TEST PATTERN
                                                                        ;PHYSICAL ADDRESS 200000 - 237776
013426  005737  002350                  TST     NXMFLG                  ;FLAG WILL BE SET IF WE ADDRESS NXM.
013432  001050                          BNE     29$                     ;IF NXM - DON'T USE MEMORY MANAGEMENT.
013434  005301                          DEC     R1                      ;DO TH INNER LOOP 32. TIMES
013436  001372                          BNE     16$
013440  005303                          DEC     R3                      ;DO THE OUTER LOOP 256. TIMES
013442  001364                          BNE     15$
013444  012701  020000                  MOV     #20000,R1               ;COUNTER TO CLEAR THE NEXT 8K WORDS
013450                          17$:
013450  005024                          CLR     (R4)+                   ;CLEAR VIRTUAL ADDRESS 120000 - 157776
013452  005737  002350                  TST     NXMFLG                  ;DOES AN NXM TRAP OCCUR?
013456  001036                          BNE     29$                     ;IF SO DON'T USE MEMORY MANAGEMENT.
013460  005301                          DEC     R1
013462  001372                          BNE     17$
013464  005037  177572                  CLR     @#177572                ;TURN OFF MEMORY MANAGEMENT

013470  012737  060000  003236          MOV     #60000,XMTBUF           ;VIRTUAL ADDRESS OF XMIT BUFFER
013476  012737  120000  003636          MOV     #120000,RCVBUF          ;VIRTUAL ADDRESS OF RCV. BUFFER
013504  022737  000001  002324          CMP     #1,BUFNUM               ;IS THERE ONLY 1 XMIT & RECEIVE BUFFER?
013512  001004                          BNE     20$                     ;IF NOT, BR
013514  012737  037777  002322          MOV     #37777,BUFSIZ           ;EACH BUFFER IS 16K BYTES
013522  000525                          BR      60$
013524                          20$:
013524  022737  000007  002324          CMP     #7,BUFNUM               ;ARE THERE 7 XMIT & RECEIVE (14 TOTAL BUFFER)?
013532  001004                          BNE     21$                     ;IF NOT - MUST BE 64 BUFFERS
013534  012737  004000  002322          MOV     #4000,BUFSIZ            ;EACH BUFFER IS 2K BYTES
013542  000515                          BR      60$
013544                          21$:
013544  012737  000376  002322          MOV     #376,BUFSIZ             ;EACH BUFFER IS 254. BYTES.
```

```
013552  000511                          BR      60$

013554                          29$:
013554  005037  177572                  CLR     @#177572        ;TURN OFF MEMORY MANAGEMENT
013560                          30$:
013560  005037  002302                  CLR     MMANAG          ;FLAG THAT MEMORY MANAGEMENT NOT USED.
013564                                  CLRVEC  #4              ;RESTORE TRAP 4.
013564  012700  000004                                                                  MOV     #4,R0
013570  104436                                                                          TRAP    C$CVEC
013572                                  MEMORY  R2              ;FIND THE FREE MEMORY AVAILABLE BETWEEN
013572  104431                                                                          TRAP    C$MEM
013574  010002                                                                          MOV     R0,R2
                                                                ;THE DIAGNOSTIC AND THE DRS (SUPERVISOR).
013576  021227  002000                  CMP     @R2,#2000       ;IS THERE AT LEAST 1K WORDS? (NOTE: CONTENTS
                                                                ;OF THE RETURNED ADDRESS OF THE START OF FREE
                                                                ;MEMORY CONTAIN THE AMOUNT OF AVAILABLE MEM.)
013602  003406                          BLE     35$             ;IF NOT AT LEAST 1K, USE DEFAULT BUFFER.
013604  010237  003236                  MOV     R2,XMTBUF       ;USE THE FREE MEMORY BUFFER.
013610  011200                          MOV     @R2,R0          ;SAVE THE WORD SIZE OF THE BUFFER.
013612  042700  000001                  BIC     #BIT0,R0        ;START WITH AN EVEN # OF WORDS.
013616  000405                          BR      40$
013620                          35$:
013620  012737  004236  003236          MOV     #BIGBUF,XMTBUF  ;USE THE DEFAULT BUFFER (1ST HALF FOR XMIT).
013626  012700  002000                  MOV     #2000,R0        ;1K WORD SIZE.
013632                          40$:
013632  013737  003236  003636          MOV     XMTBUF,RCVBUF   ;CALCULATE THE RECEIVE BUFFER ADDRESS
013640  060037  003636                  ADD     R0,RCVBUF       ;AS STARTING IN THE 2ND HALF OF THE BUFFER.
013644  010001                          MOV     R0,R1           ;BUFFER SIZE IN WORDS.
013646  022737  000001  002324          CMP     #1,BUFNUM       ;ARE WE SETTING UP 1 RECEIVE AND XMIT BUFFER?
013654  001415                          BEQ     47$             ;IF YES - R1 = BYTE SIZE FOR BOTH BUFFERS.
013656  022737  000007  002324          CMP     #7,BUFNUM       ;ARE WE SETTING UP 7 RCV & 7 XMIT BUFFERS?
013664  001004                          BNE     45$             ;IF NOT WE MUST NEED 64 RCV & 64 XMIT BUFFERS.
013666  006201                          ASR     R1              ;R1 = # BYTES IN THE BUFFERS/8
013670  006201                          ASR     R1
013672  006201                          ASR     R1
013674  000405                          BR      47$
013676                          45$:
013676  012704  000007                  MOV     #7,R4           ;DIVIDE BYTES BY 128.
013702                          46$:
013702  006201                          ASR     R1              ;SHIFT RIGHT 7 TIMES
013704  005304                          DEC     R4
013706  001375                          BNE     46$
013710                          47$:
013710  010137  002322                  MOV     R1,BUFSIZ       ;SAVE THE BUFFER SIZE IN BYTES.
013714  162737  000002  002322          SUB     #2,BUFSIZ       ;ADJUST BUFFER SIZE BECAUSE WE
                                                                ;WILL ADJUST BUFFER STARTING ADDRESS.
013722  042737  000001  002322          BIC     #1,BUFSIZ       ;ENSURE WE START WITH AN EVEN # OF BYTES.
013730  006200                          ASR     R0              ;# OF WORDS IN ALL XMIT BUFFERS.
013732  010001                          MOV     R0,R1           ;SAVE # OF WORDS IN ALL RCV BUFFERS.
013734  013702  003236                  MOV     XMTBUF,R2       ;ADDRESS OF START OF XMIT BUFFERS.
013740                          50$:
013740  012703  002416                  MOV     #$CCITT,R3      ;ADDRESS OF TEST PATTERN
013744  012704  000040                  MOV     #32.,R4         ;# OF WORDS IN THE TEST PATTERN.
013750                          51$:
013750  012312                          MOV     (R3)+,(R2)      ;WRITE TEST PATTERN INTO ALL XMIT BUFFERS.
013752  005300                          DEC     R0              ;ARE ALL THE XMIT BUFFERS WRITTEN?
013754  001403                          BEQ     55$             ;IF YES PROCEED.
```

```
013756  005304                          DEC     R4              ;CONTINUE WITH TEST PATTERN TILL DONE.
013760  001373                          BNE     51$
013762  000766                          BR      50$             ;START AT BEGINNING OF TEST PATTERN.
013764                          55$:
013764  013702  003636                  MOV     RCVBUF,R2       ;ADDRESS OF RECEIVE BUFFERS
013770                          56$:
013770  005022                          CLR     (R2)+           ;CLEAR ALL RECEIVE BUFFERS.
013772  005301                          DEC     R1
013774  001375                          BNE     56$


013776                          60$:
013776  013700  003636                  MOV     RCVBUF,R0       ;ADDRESS OF RECEIVE BUFFER
014002  012701  003636                  MOV     #RCVBUF,R1      ;TABLE ADDRESS OF RCV BUFFER POINTERS.
014006  013702  002324                  MOV     BUFNUM,R2       ;# OF RCV. BUFFERS.
014012                          65$:
014012  010021                          MOV     R0,(R1)+        ;SAVE THE RECEIVE BUFFER ADDRESS
014014  013721  002322                  MOV     BUFSIZ,(R1)+    ;SAVE THE BUFFER SIZE
014020  063700  002322                  ADD     BUFSIZ,R0       ;CALCULATE THE NEXT BUFFER ADDRESS.
014024  005200                          INC     R0              ;CHANGE EVEN ADDRESS TO ODD & ODD TO EVEN.
014026  005302                          DEC     R2              ;CALCULATE ALL THE BUFFER ADDRESSES.
014030  001370                          BNE     65$

014032  013700  003236                  MOV     XMTBUF,R0       ;ADDRESS OF TRANSMIT BUFFERS
014036  012701  003236                  MOV     #XMTBUF,R1      ;TABLE OF XMIT BUFFER POINTERS.
014042  013702  002324                  MOV     BUFNUM,R2       ;#OF XMIT BUFFERS.
014046  012703  000004                  MOV     #4,R3           ;R3 IS USED TO VARY THE CHARACTER COUNT.
014052                          70$:
014052  010021                          MOV     R0,(R1)+        ;SAVE THE XMIT BUFFER ADDRESS.
014054  013711  002322                  MOV     BUFSIZ,(R1)     ;SAVE THE BUFFER SIZE.
014060  160321                          SUB     R3,(R1)+        ;VARY THE BUFFER SIZE
014062  063700  002322                  ADD     BUFSIZ,R0       ;CALCULATE THE NEXT BUFFER ADDRESS
014066  005303                          DEC     R3              ;CHANGE THE CHARACTER COUNT VARIABLE.
014070  032703  000001                  BIT     #BIT0,R3        ;IS THE CONTENTS OF R3 ODD
014074  001001                          BNE     72$             ;IF YES, DON'T ADJUST BUFFER ADDRESS.
014076  005200                          INC     R0              ;CHANGE EVEN TO ODD ETC.
014100                          72$:
014100  005703                          TST     R3              ;WHAT IS R3.
014102  002002                          BGE     75$             ;CONTINUE UNTIL R3 = -1
014104  012703  000004                  MOV     #4,R3           ;RE-INIT. THE R3 VARIABLE AGAIN.
014110                          75$:
014110  005302                          DEC     R2              ;CALCULATE ALL THE XMIT BUFFERS.
014112  001357                          BNE     70$

014114  005037  002350                  CLR     NXMFLG          ;RESTORE FLAG USED IN TRAP VECTOR.
014120  005037  002372                  CLR     SUBRPC          ;CLEAR PC.
014124  000207                          RETURN
```

```
                                        ;;*******************************************************************
                                        ;;*******************************************************************
                                        ;
                                        ;                       SUBROUTINE $INOUT
                                        ;
                                        ;               FUNCTION - TO MANAGE THE INTERRUPT FROM BASE IN
                                        ;                          TO BA/CC OUT IN THE INTERRUPT TESTS 15-19
                                        ;
                                        ;       ENTRY CONDITIONS - BUFNUM = # OF RCV AND XMIT BUFFERS
                                        ;                          ALL BUFFERS SET UP IN  THE $BUFFS SUBROUTINE.
                                        ;                          WAIT3  = # OF OUTER LOOP TIMEOUT COUNTERS.
                                        ;                                   THIS VALUE IS DETERMINED BY THE BAUD
                                        ;                                   RATE IN THE INIT. SECTION OF CODE.
                                        ;
                                        ;       EXIT CONDITIONS  -
                                        ;
                                        ;       REGISTERS        - R0 - R5 DESTROYED
                                        ;
                                        ;;*******************************************************************
                                        ;;*******************************************************************
014126                                  $INOUT:
014126  011637  002372                          MOV     (SP),SUBRPC     ;SAVE THE PC AFTER THE CALL TO $LOOP
014132  162737  000004  002372                  SUB     #4,SUBRPC       ;BACKUP TO THE PC OF THE ACTUAL CALL.
014140  012737  000001  002374                  MOV     #1,NESTPC       ;FLAG THAT ANY SUBROUTINE USED WILL BE NESTED.
014146  013737  002324  002326                  MOV     BUFNUM,INRCV    ;# OF BA/CC IN RECEIVES
014154  013737  002324  002330                  MOV     BUFNUM,INXMIT   ;# OF BA/CC IN TRANSMITS
014162  013737  002324  002332                  MOV     BUFNUM,OUTRCV   ;# OF BA/CC OUT RECEIVES
014170  013737  002324  002334                  MOV     BUFNUM,OUTXMT   ;# OF BA/CC OUT TRANSMITS
014176  005037  002352                          CLR     INFLAG          ;CLEAR INPUT BA/CC FLAG
014202  005037  002354                          CLR     OUTFLG          ;CLEAR OUTPUT BA/CC FLAG
014206  005037  002272                          CLR     START           ;CLEAR FLAG TO SHOW START UP NOT DONE (SET
                                                                        ;AFTER CONTROL IN)
014212  012702  003636                          MOV     #RCVBUF,R2      ;ADDR OF RCV. BUFFER TABLE (FOR INPUT)
014216  012703  003236                          MOV     #XMTBUF,R3      ;ADDR OF XMIT BUFFER TABLE (FOR INPUT)
014222  012704  003636                          MOV     #RCVBUF,R4      ;ADDR OF RCV. BUFFER TABLE (OUTPUT CHECKING)
014226  012705  003236                          MOV     #XMTBUF,R5      ;ADDR OF XMIT BUFFER TABLE (OUTPUT CHECKING)
014232                                          SETPRI  #PRI04          ;SET THE PRIORITY TO LEVEL 4 TO ALLOW THE
014232  012700  000200                                                                          MOV     #PRI04,R0
014236  104441                                                                                  TRAP    C$SPRI
                                                                        ;DMR TO INTERRUPT AT LEVEL 5
014240  013737  002316  002320                  MOV     WAIT3,WAIT4     ;TIMEOUT COUNTER DETERMINED BY BAUD RATE.
014246  112777  000143  165756                  MOVB    #IESET!RQI!BASEI,@BSEL0 ;FIRST COMMAND - BASE IN.
014254                                  8$:
014254  012701  001000                          MOV     #1000,R1        ;INNER LOOP COUNTER
014260                                  10$:
014260                                          BREAK                   ;OPERATOR INTERRUPT ENABLE.  CALL TO
014260  104422                                                                                  TRAP    C$BRK
                                                                        ;THE SUPERVISOR TO ALLOW CONSOLE INTERRUPT
                                                                        ;(NOTE: INFLAG AND OUTFLG SET IN THE INTERRUPT
                                                                        ;SERVICE ROUTINES)
014262  005737  002352                          TST     INFLAG          ;ARE THE INPUTS DONE?   (INISR DONE?)
014266  001403                                  BEQ     12$             ;IF NOT KEEP CHECKING.
014270  005737  002354                          TST     OUTFLG          ;ARE THE OUTPUTS DONE?  (OUTISR DONE?)
014274  001026                                  BNE     20$             ;IF YES EXIT WAIT LOOP.
014276                                  12$:
014276                                          DELAY   1               ;WAIT 100 MICROSECONDS.
```

```
        014276  012727  000001                                                          MOV     #1,(PC)+
        014302  000000                                                                  .WORD   0
        014304  013727  002116                                                          MOV     L$DLY,(PC)+
        014310  000000                                                                  .WORD   0
        014312  005367  177772                                                          DEC     -6(PC)
        014316  001375                                                                  BNE     .-4
        014320  005367  177756                                                          DEC     -22(PC)
        014324  001367                                                                  BNE     .-20
     55 014326  005301                          DEC     R1              ;CONTINUE IN LOOP UNTIL R1 = 0.
     56 014330  001353                          BNE     10$
     57 014332  005337  002320                  DEC     WAIT4           ;DECREMENT OUTER LOOP COUNTER
     58 014336  001346                          BNE     8$              ;IF NOT DONE - GO THROUGH INNER LOOP AGAIN.
     59 014340                                  ERRDF   2,EMG2,ERRG1    ;TIMEOUT MESSAGE.
        014340  104455                                                                  TRAP    C$ERDF
        014342  000002                                                                  .WORD   2
        014344  017715                                                                  .WORD   EMG2
        014346  014604                                                                  .WORD   ERRG1
     60                                                         ;ALSO PRINT # OF BUFFERS NOT COMPLETE.
     61
     62 014350  000453                          BR      60$             ;EXIT
     63 014352                          20$:
     64
     65 014352  012700  003636                  MOV     #RCVBUF,R0      ;RECEIVE BUFFER POINTER TABLE ADDRESS.
     66 014356  012701  003236                  MOV     #XMTBUF,R1      ;TRANSMIT BUFFERS
     67 014362  013702  002324                  MOV     BUFNUM,R2       ;# OF RCV. AND XMIT BUFFERS.
     68 014366  005737  002302                  TST     MMANAG          ;ARE THE BUFFERS MEMORY MANAGED?
     69 014372  001403                          BEQ     40$             ;IF YES - PROCEED.
     70 014374  012737  000001  177572          MOV     #1,@#177572     ;TURN ON MEMORY MANAGEMENT
     71 014402                          40$:
     72 014402  012003                          MOV     (R0)+,R3        ;ADDRESS OF A RECEIVE BUFFER.
     73 014404  012104                          MOV     (R1)+,R4        ;ADDRESS OF A TRANSMIT BUFFER.
     74 014406  011005                          MOV     @R0,R5          ;CHARACTER COUNT.
     75 014410  022021                          CMP     (R0)+,(R1)+     ;ARE THE CHARACTER COUNTS THE SAME?
     76 014412  001412                          BEQ     45$             ;IF YES - PROCEED.
     77 014414  005737  002302                  TST     MMANAG          ;IS MEMORY MANAGEMENT TURNED ON?
     78 014420  001402                          BEQ     41$             ;IF NOT - SKIP TURN OFF.
     79 014422  005037  177572                  CLR     @#177572        ;TURN OFF MEMORY MANAGEMENT.
     80 014426                          41$:
     81 014426                                  ERRDF   12,EMG12,ERRG10
        014426  104455                                                                  TRAP    C$ERDF
        014430  000014                                                                  .WORD   12
        014432  020127                                                                  .WORD   EMG12
        014434  016152                                                                  .WORD   ERRG10
     82 014436  000420                          BR      60$             ;EXIT
     83 014440                          45$:
     84 014440  122324                          CMPB    (R3)+,(R4)+     ;ARE THE CHARACTERS THE SAME?
     85 014442  001005                          BNE     50$             ;IF NOT - ERROR EXIT
     86 014444  005305                          DEC     R5              ;CHECK ALL THE CHARACTERS
     87 014446  001374                          BNE     45$
     88 014450  005302                          DEC     R2              ;CHECK ALL THE BUFFERS.
     89 014452  001353                          BNE     40$
     90 014454  000411                          BR      60$
     91 014456                          50$:
     92 014456  005737  002302                  TST     MMANAG          ;IS MEMORY MANAGEMENT TURNED ON?
     93 014462  001402                          BEQ     51$             ;IF NOT - SKIP TURN OFF.
     94 014464  005037  177572                  CLR     @#177572        ;TURN OFF MEMORY MANAGEMENT.
     95 014470                          51$:
```

```
 96 014470                                  ERRDF   15,EMG15,ERRG12
    014470  104455                                                                          TRAP    C$ERDF
    014472  000017                                                                          .WORD   15
    014474  020223                                                                          .WORD   EMG15
    014476  016236                                                                          .WORD   ERRG12
 97 014500                              60$:
 98 014500  005737  002302                  TST     MMANAG          ;IS MEMORY MANAGEMENT TURNED ON?
 99 014504  001402                          BEQ     61$             ;IF NOT - SKIP TURN OFF.
100 014506  005037  177572                  CLR     @#177572        ;TURN OFF MEMORY MANAGEMENT.
101 014512                              61$:
102 014512  042777  000120  165512          BIC     #IESET!IECLR,@SEL0 ;DISABLE BOTH INPUT INTERRUPTS
103 014520  042777  000100  165506          BIC     #IEO,@SEL2      ;DISABLE OUTPUT INTERRUPT
104 014526  022737  000021  002114          CMP     #17.,L$TEST     ;IS THIS TEST 17, 18 OR 19 ?
105 014534  003011                          BGT     62$             ;IF NOT - SHUTDOWN.
106                                                                 ;NOTE:
107                                                                 ;DOING AN UPDATE IN TESTS 17 - 19, ALLOWS
108                                                                 ;THE USER TO CHECK OUT REMOTE LOOPBACK BETER.
109                                                                 ;A SHUTDOWN WHEN TESTING THE REMOTE LOOPBACK,
110                                                                 ;WOULD CAUSE THE CONNECTION TO BE DROPPED.
111 014536                                  DMRIN   UPDATE          ;DO A DMR UPDATE.
                                                                    ;**** MACRO EXPANSION ****
    014536  004737  012060                  JSR     PC, $DMRIN      ;CALL DMR MODE INPUT ROUTINE
    014542  000011                                  .WORD   UPDATE  ;INPUT COMMAND
    014544  000000                                  .WORD   0       ;NO SEL4
    014546  000000                                  .WORD   0       ;NO SEL6
                                                                    ;****                   ****
112 014550                                  WAIT    RDO             ;WAIT FOR RDO
                                                                    ;**** MACRO EXPANSION ****
    014550  004737  010274                  JSR     PC, $WAIT       ;CALL WAIT ROUTINE
    014554  000001                                  .WORD   1       ;FLAG THAT WE'RE WAITING FOR RDO
                                                                    ;****                   ****
113 014556  000402                          BR      63$
114 014560                              62$:
115 014560                                  SHUTDN                  ;SHUT DOWN THE DMR
                                                                    ;**** MACRO EXPANSION ****
    014560  004737  012550                  JSR     PC, $HALT       ;DMR HALT ROUTINE.
                                                                    ;****                   ****
116 014564                              63$:
117 014564                                  SETPRI  #PRI07          ;RETURN PROCESSOR PRIORITY TO 7
    014564  012700  000340                                                                  MOV     #PRI07,R0
    014570  104441                                                                          TRAP    C$SPRI
118 014572  005037  002374                  CLR     NESTPC          ;CLEAR NESTED FLAG.
119 014576  005037  002372                  CLR     SUBRPC          ;CLEAR PC.
120 014602  000207                          RETURN
121
122
123
124
125
126
127
128
```

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

014604                          BGNMSG  ERRG1
014604                                                                          ERRG1::
014604                                  PRINTB  #FMG3,SUBRPC    ;PC THAT SUBROUTINE WAS CALLED.
014604  013746  002372                                                          MOV     SUBRPC,-(SP)
014610  012746  016354                                                          MOV     #FMG3,-(SP)
014614  012746  000002                                                          MOV     #2,-(SP)
014620  010600                                                                  MOV     SP,R0
014622  104414                                                                  TRAP    C$PNTB
014624  062706  000006                                                          ADD     #6,SP
014630                                  PRINTB  #FMG1,@SEL0,@SEL2 ;PRINT SEL0 AND SEL2 CONTENTS.
014630  017746  165400                                                          MOV     @SEL2,-(SP)
014634  017746  165372                                                          MOV     @SEL0,-(SP)
014640  012746  016270                                                          MOV     #FMG1,-(SP)
014644  012746  000003                                                          MOV     #3,-(SP)
014650  010600                                                                  MOV     SP,R0
014652  104414                                                                  TRAP    C$PNTB
014654  062706  000010                                                          ADD     #10,SP
014660                                  PRINTB  #FMG2,@SEL4,@SEL6 ;PRINT SEL4 AND SEL2 CONTENTS.
014660  017746  165354                                                          MOV     @SEL6,-(SP)
014664  017746  165346                                                          MOV     @SEL4,-(SP)
014670  012746  016322                                                          MOV     #FMG2,-(SP)
014674  012746  000003                                                          MOV     #3,-(SP)
014700  010600                                                                  MOV     SP,R0
014702  104414                                                                  TRAP    C$PNTB
014704  062706  000010                                                          ADD     #10,SP
014710                                  PRINTB  #FMG21,BUFNUM   ;# OF BUFFERS
014710  013746  002324                                                          MOV     BUFNUM,-(SP)
014714  012746  017447                                                          MOV     #FMG21,-(SP)
014720  012746  000002                                                          MOV     #2,-(SP)
014724  010600                                                                  MOV     SP,R0
014726  104414                                                                  TRAP    C$PNTB
014730  062706  000006                                                          ADD     #6,SP
014734                                  PRINTB  #FMG22,BUFSIZ   ;BUFFER SIZE
014734  013746  002322                                                          MOV     BUFSIZ,-(SP)
014740  012746  017515                                                          MOV     #FMG22,-(SP)
014744  012746  000002                                                          MOV     #2,-(SP)
014750  010600                                                                  MOV     SP,R0
014752  104414                                                                  TRAP    C$PNTB
014754  062706  000006                                                          ADD     #6,SP
014760  005437  002326                  NEG     INRCV           ;NEGATE BUFFER VALUES
014764  005437  002330                  NEG     INXMIT
014770  005437  002332                  NEG     OUTRCV
014774  005437  002334                  NEG     OUTXMT
015000  063737  002324  002326          ADD     BUFNUM,INRCV    ;CALCULATE BUFFERS ASSIGNED.
015006  063737  002324  002330          ADD     BUFNUM,INXMIT
015014  063737  002324  002332          ADD     BUFNUM,OUTRCV   ;CALCULATE BUFFERS RECEIVED.
015022  063737  002324  002334          ADD     BUFNUM,OUTXMT
015030                                  PRINTB  #FMG23,INRCV,INXMIT
015030  013746  002330                                                          MOV     INXMIT,-(SP)
015034  013746  002326                                                          MOV     INRCV,-(SP)
```

```
        015040  012746  017542                                                          MOV     #FMG23,-(SP)
        015044  012746  000003                                                          MOV     #3,-(SP)
        015050  010600                                                                  MOV     SP,R0
        015052  104414                                                                  TRAP    C$PNTB
        015054  062706  000010                                                          ADD     #10,SP
     23 015060                          PRINTB  #FMG24,OUTRCV,OUTXMT
        015060  013746  002334                                                          MOV     OUTXMT,-(SP)
        015064  013746  002332                                                          MOV     OUTRCV,-(SP)
        015070  012746  017623                                                          MOV     #FMG24,-(SP)
        015074  012746  000003                                                          MOV     #3,-(SP)
        015100  010600                                                                  MOV     SP,R0
        015102  104414                                                                  TRAP    C$PNTB
        015104  062706  000010                                                          ADD     #10,SP
     24 015110                          ENDMSG
        015110                                                                  L10002:
        015110  104423                                                                  TRAP    C$MSG
     25
     26
     27 015112                          BGNMSG  ERRG2
        015112                                                                  ERRG2::
     28 015112  005737  002372                  TST     SUBRPC          ;IS THE ERROR IN A SUBROUTINE?
     29 015116  001412                          BEQ     10$             ;IF NOT, DON'T PRINT SUBR. PC
     30 015120                                  PRINTB  #FMG3,SUBRPC    ;PC THAT SUBROUTINE WAS CALLED.
        015120  013746  002372                                                          MOV     SUBRPC,-(SP)
        015124  012746  016354                                                          MOV     #FMG3,-(SP)
        015130  012746  000002                                                          MOV     #2,-(SP)
        015134  010600                                                                  MOV     SP,R0
        015136  104414                                                                  TRAP    C$PNTB
        015140  062706  000006                                                          ADD     #6,SP
     31 015144                          10$:
     32 015144                                  PRINTB  #FMG1,@SEL0,@SEL2 ;PRINT SEL0 AND SEL2 CONTENTS.
        015144  017746  165064                                                          MOV     @SEL2,-(SP)
        015150  017746  165056                                                          MOV     @SEL0,-(SP)
        015154  012746  016270                                                          MOV     #FMG1,-(SP)
        015160  012746  000003                                                          MOV     #3,-(SP)
        015164  010600                                                                  MOV     SP,R0
        015166  104414                                                                  TRAP    C$PNTB
        015170  062706  000010                                                          ADD     #10,SP
     33 015174                                  PRINTB  #FMG2,@SEL4,@SEL6 ;PRINT SEL4 AND SEL2 CONTENTS.
        015174  017746  165040                                                          MOV     @SEL6,-(SP)
        015200  017746  165032                                                          MOV     @SEL4,-(SP)
        015204  012746  016322                                                          MOV     #FMG2,-(SP)
        015210  012746  000003                                                          MOV     #3,-(SP)
        015214  010600                                                                  MOV     SP,R0
        015216  104414                                                                  TRAP    C$PNTB
        015220  062706  000010                                                          ADD     #10,SP
     34 015224                          ENDMSG
        015224                                                                  L10003:
        015224  104423                                                                  TRAP    C$MSG
     35
     36 015226                          BGNMSG  ERRG3
        015226                                                                  ERRG3::
     37 015226  005737  002372                  TST     SUBRPC          ;IS THE ERROR IN A SUBROUTINE?
     38 015232  001412                          BEQ     10$             ;IF NOT, DON'T PRINT SUBR. PC
     39 015234                                  PRINTB  #FMG3,SUBRPC    ;PC THAT SUBROUTINE WAS CALLED.
        015234  013746  002372                                                          MOV     SUBRPC,-(SP)
        015240  012746  016354                                                          MOV     #FMG3,-(SP)
```

```
        015244  012746  000002                                                          MOV     #2,-(SP)
        015250  010600                                                                  MOV     SP,R0
        015252  104414                                                                  TRAP    C$PNTB
        015254  062706  000006                                                          ADD     #6,SP
     40 015260                          10$:
     41 015260                                  PRINTB  #FMG1,@SEL0,@SEL2 ;PRINT SEL0 AND SEL2 CONTENTS.
        015260  017746  164750                                                          MOV     @SEL2,-(SP)
        015264  017746  164742                                                          MOV     @SEL0,-(SP)
        015270  012746  016270                                                          MOV     #FMG1,-(SP)
        015274  012746  000003                                                          MOV     #3,-(SP)
        015300  010600                                                                  MOV     SP,R0
        015302  104414                                                                  TRAP    C$PNTB
        015304  062706  000010                                                          ADD     #10,SP
     42 015310  032777  100000  164714          BIT     #RUN,@SEL0      ;IS THE RUN BIT SET
     43 015316  001043                          BNE     20$             ;IF RUN SET, CHECK.
     44 015320  122777  000001  164716          CMPB    #1,@BSEL3       ;DID CPU MICRO. FAIL?
     45 015326  001011                          BNE     12$             ;IF NOT SEE IF LU FAILED.
     46 015330                                  PRINTB  #FMG4           ;CPU MICRO. FAILED.
        015330  012746  016426                                                          MOV     #FMG4,-(SP)
        015334  012746  000001                                                          MOV     #1,-(SP)
        015340  010600                                                                  MOV     SP,R0
        015342  104414                                                                  TRAP    C$PNTB
        015344  062706  000004                                                          ADD     #4,SP
     47 015350  000441                          BR      25$
     48 015352                          12$:
     49 015352  122777  000002  164664          CMPB    #2,@BSEL3       ;DID LINE UNIT MICRO. FAIL?
     50 015360  001011                          BNE     15$
     51 015362                                  PRINTB  #FMG5           ;LINE UNIT FAILED.
        015362  012746  016457                                                          MOV     #FMG5,-(SP)
        015366  012746  000001                                                          MOV     #1,-(SP)
        015372  010600                                                                  MOV     SP,R0
        015374  104414                                                                  TRAP    C$PNTB
        015376  062706  000004                                                          ADD     #4,SP
     52 015402  000424                          BR      25$
     53 015404                          15$:
     54 015404                                  PRINTB  #FMG5           ;NO RUN - MASTER CLEAR FAILED.
        015404  012746  016457                                                          MOV     #FMG5,-(SP)
        015410  012746  000001                                                          MOV     #1,-(SP)
        015414  010600                                                                  MOV     SP,R0
        015416  104414                                                                  TRAP    C$PNTB
        015420  062706  000004                                                          ADD     #4,SP
     55 015424  000413                          BR      25$
     56 015426                          20$:
     57 015426  105777  164612                  TSTB    @BSEL3          ;IS BSEL3 STILL 0?
     58 015432  001010                          BNE     25$             ;IF NOT - SEE IF MICRODIAG. RUN.
     59 015434                                  PRINTB  #FMG19          ;DEVICE IS NOT DMR (DMC?)
        015434  012746  017424                                                          MOV     #FMG19,-(SP)
        015440  012746  000001                                                          MOV     #1,-(SP)
        015444  010600                                                                  MOV     SP,R0
        015446  104414                                                                  TRAP    C$PNTB
        015450  062706  000004                                                          ADD     #4,SP
     60 015454                          25$:
     61 015454                          ENDMSG
        015454                                                                  L10004:
        015454  104423                                                                  TRAP    C$MSG
     62
     63
```

```
 64 015456                          BGNMSG  ERRG4
    015456                                                                          ERRG4::
 65 015456  005737  002372                  TST     SUBRPC          ;IS THE ERROR IN A SUBROUTINE?
 66 015462  001412                          BEQ     10$             ;IF NOT, DON'T PRINT SUBR. PC
 67 015464                                  PRINTB  #FMG3,SUBRPC    ;PC THAT SUBROUTINE WAS CALLED.
    015464  013746  002372                                                          MOV     SUBRPC,-(SP)
    015470  012746  016354                                                          MOV     #FMG3,-(SP)
    015474  012746  000002                                                          MOV     #2,-(SP)
    015500  010600                                                                  MOV     SP,R0
    015502  104414                                                                  TRAP    C$PNTB
    015504  062706  000006                                                          ADD     #6,SP
 68 015510                          10$:
 69 015510  105737  002641                  TSTB    BASE+3          ;ONLY PRINT NON-ZERO VALUES
 70 015514  001003                          BNE     11$
 71 015516  105737  002644                  TSTB    BASE+6
 72 015522  001416                          BEQ     12$
 73 015524                          11$:
 74 015524                                  PRINTB  #FMG7,<B,BASE+3>,<B,BASE+6>
    015524  005046                                                                  CLR     -(SP)
    015526  153716  002644                                                          BISB    BASE+6,(SP)
    015532  005046                                                                  CLR     -(SP)
    015534  153716  002641                                                          BISB    BASE+3,(SP)
    015540  012746  016510                                                          MOV     #FMG7,-(SP)
    015544  012746  000003                                                          MOV     #3,-(SP)
    015550  010600                                                                  MOV     SP,R0
    015552  104414                                                                  TRAP    C$PNTB
    015554  062706  000010                                                          ADD     #10,SP
 75 015560                          12$:
 76 015560  105737  002643                  TSTB    BASE+5
 77 015564  001003                          BNE     13$
 78 015566  105737  002646                  TSTB    BASE+8.
 79 015572  001416                          BEQ     14$
 80 015574                          13$:
 81 015574                                  PRINTB  #FMG8,<B,BASE+5>,<B,BASE+8.>
    015574  005046                                                                  CLR     -(SP)
    015576  153716  002646                                                          BISB    BASE+8.,(SP)
    015602  005046                                                                  CLR     -(SP)
    015604  153716  002643                                                          BISB    BASE+5,(SP)
    015610  012746  016561                                                          MOV     #FMG8,-(SP)
    015614  012746  000003                                                          MOV     #3,-(SP)
    015620  010600                                                                  MOV     SP,R0
    015622  104414                                                                  TRAP    C$PNTB
    015624  062706  000010                                                          ADD     #10,SP
 82 015630                          14$:
 83 015630  105737  002642                  TSTB    BASE+4
 84 015634  001003                          BNE     15$
 85 015636  105737  002645                  TSTB    BASE+7
 86 015642  001416                          BEQ     16$
 87 015644                          15$:
 88 015644                                  PRINTB  #FMG9,<B,BASE+4>,<B,BASE+7>
    015644  005046                                                                  CLR     -(SP)
    015646  153716  002645                                                          BISB    BASE+7,(SP)
    015652  005046                                                                  CLR     -(SP)
    015654  153716  002642                                                          BISB    BASE+4,(SP)
    015660  012746  016632                                                          MOV     #FMG9,-(SP)
    015664  012746  000003                                                          MOV     #3,-(SP)
    015670  010600                                                                  MOV     SP,R0
```

```
        015672  104414                                                                  TRAP    C$PNTB
        015674  062706  000010                                                          ADD     #10,SP
     89 015700                          16$:
     90 015700  105737  002650                  TSTB    BASE+10.
     91 015704  001003                          BNE     17$
     92 015706  105737  002647                  TSTB    BASE+9.
     93 015712  001416                          BEQ     20$
     94 015714                          17$:
     95 015714                                  PRINTB  #FMG10,<B,BASE+10.>,<B,BASE+9.>
        015714  005046                                                                  CLR     -(SP)
        015716  153716  002647                                                          BISB    BASE+9.,(SP)
        015722  005046                                                                  CLR     -(SP)
        015724  153716  002650                                                          BISB    BASE+10.,(SP)
        015730  012746  016703                                                          MOV     #FMG10,-(SP)
        015734  012746  000003                                                          MOV     #3,-(SP)
        015740  010600                                                                  MOV     SP,R0
        015742  104414                                                                  TRAP    C$PNTB
        015744  062706  000010                                                          ADD     #10,SP
     96 015750                          20$:
     97 015750                          ENDMSG
        015750                                                                  L10005:
        015750  104423                                                                  TRAP    C$MSG
     98
     99
    100
    101 015752                          BGNMSG  ERRG7
        015752                                                                  ERRG7::
    102 015752                                  PRINTB  #FMG12          ;BA/CC OUT RECV
        015752  012746  016773                                                          MOV     #FMG12,-(SP)
        015756  012746  000001                                                          MOV     #1,-(SP)
        015762  010600                                                                  MOV     SP,R0
        015764  104414                                                                  TRAP    C$PNTB
        015766  062706  000004                                                          ADD     #4,SP
    103 015772                                  PRINTB  #FMG13,@SEL4,@SEL6 ;ACTUAL BA/CC
        015772  017746  164242                                                          MOV     @SEL6,-(SP)
        015776  017746  164234                                                          MOV     @SEL4,-(SP)
        016002  012746  017024                                                          MOV     #FMG13,-(SP)
        016006  012746  000003                                                          MOV     #3,-(SP)
        016012  010600                                                                  MOV     SP,R0
        016014  104414                                                                  TRAP    C$PNTB
        016016  062706  000010                                                          ADD     #10,SP
    104 016022                                  PRINTB  #FMG15,-2(R4)       ;EXPECTED BA/CC
        016022  016446  177776                                                          MOV     -2(R4),-(SP)
        016026  012746  017154                                                          MOV     #FMG15,-(SP)
        016032  012746  000002                                                          MOV     #2,-(SP)
        016036  010600                                                                  MOV     SP,R0
        016040  104414                                                                  TRAP    C$PNTB
        016042  062706  000006                                                          ADD     #6,SP
    105 016046                          ENDMSG
        016046                                                                  L10006:
        016046  104423                                                                  TRAP    C$MSG
    106
    107 016050                          BGNMSG  ERRG8
        016050                                                                  ERRG8::
    108 016050                                  PRINTB  #FMG11          ;BA/CC OUT XMIT
        016050  012746  016741                                                          MOV     #FMG11,-(SP)
        016054  012746  000001                                                          MOV     #1,-(SP)
```

```
        016060  010600                                                                    MOV     SP,R0
        016062  104414                                                                    TRAP    C$PNTB
        016064  062706  000004                                                            ADD     #4,SP
    109 016070                          PRINTB  #FMG13,@SEL4,@SEL6   ;ACTUAL BA/CC
        016070  017746  164144                                                            MOV     @SEL6,-(SP)
        016074  017746  164136                                                            MOV     @SEL4,-(SP)
        016100  012746  017024                                                            MOV     #FMG13,-(SP)
        016104  012746  000003                                                            MOV     #3,-(SP)
        016110  010600                                                                    MOV     SP,R0
        016112  104414                                                                    TRAP    C$PNTB
        016114  062706  000010                                                            ADD     #10,SP
    110 016120                          PRINTB  #FMG14,-4(R5),-2(R5) ;EXPECTED BA/CC
        016120  016546  177776                                                            MOV     -2(R5),-(SP)
        016124  016546  177774                                                            MOV     -4(R5),-(SP)
        016130  012746  017100                                                            MOV     #FMG14,-(SP)
        016134  012746  000003                                                            MOV     #3,-(SP)
        016140  010600                                                                    MOV     SP,R0
        016142  104414                                                                    TRAP    C$PNTB
        016144  062706  000010                                                            ADD     #10,SP
    111 016150                      ENDMSG
        016150                                                                  L10007:
        016150  104423                                                                    TRAP    C$MSG
    112
    113
    114 016152                      BGNMSG  ERRG10
        016152                                                                  ERRG10::
    115 016152                          PRINTB  #FMG16,-2(R0),-2(R1) ;RCV CC & XMIT CC
        016152  016146  177776                                                            MOV     -2(R1),-(SP)
        016156  016046  177776                                                            MOV     -2(R0),-(SP)
        016162  012746  017203                                                            MOV     #FMG16,-(SP)
        016166  012746  000003                                                            MOV     #3,-(SP)
        016172  010600                                                                    MOV     SP,R0
        016174  104414                                                                    TRAP    C$PNTB
        016176  062706  000010                                                            ADD     #10,SP
    116 016202                      ENDMSG
        016202                                                                  L10010:
        016202  104423                                                                    TRAP    C$MSG
    117
    118 016204                      BGNMSG  ERRG11
        016204                                                                  ERRG11::
    119 016204                          PRINTB  #FMG17,-4(R0),-4(R1) ;RCV BUFFER & XMIT BUFFER
        016204  016146  177774                                                            MOV     -4(R1),-(SP)
        016210  016046  177774                                                            MOV     -4(R0),-(SP)
        016214  012746  017262                                                            MOV     #FMG17,-(SP)
        016220  012746  000003                                                            MOV     #3,-(SP)
        016224  010600                                                                    MOV     SP,R0
        016226  104414                                                                    TRAP    C$PNTB
        016230  062706  000010                                                            ADD     #10,SP
    120 016234                      ENDMSG
        016234                                                                  L10011:
        016234  104423                                                                    TRAP    C$MSG
    121
    122 016236                      BGNMSG  ERRG12
        016236                                                                  ERRG12::
    123 016236  005303                      DEC     R3              ;BACKUP TO RECEIVE ADDRESS
    124 016240  005304                      DEC     R4              ;BACKUP TO TRANSMIT ADDRESS
    125 016242                          PRINTB  #FMG18,R3,R4    ;PRINT OUT ADDRESS
```

```
        016242  010446                                                    MOV     R4,-(SP)
        016244  010346                                                    MOV     R3,-(SP)
        016246  012746  017335                                            MOV     #FMG18,-(SP)
        016252  012746  000003                                            MOV     #3,-(SP)
        016256  010600                                                    MOV     SP,R0
        016260  104414                                                    TRAP    C$PNTB
        016262  062706  000010                                            ADD     #10,SP
    126 016266                          ENDMSG
        016266                                                    L10012:
        016266  104423                                                    TRAP    C$MSG
    127
    128
    129
    130
    131
    132
    133 016270      045     101     123  FMG1:   .ASCIZ  /%ASEL0: %06%A SEL2: %06%N/
        016273      105     114     060
        016276      072     040     045
        016301      117     066     045
        016304      101     040     123
        016307      105     114     062
        016312      072     040     045
        016315      117     066     045
        016320      116     000
    134 016322      045     101     123  FMG2:   .ASCIZ  /%ASEL4: %06%A SEL6: %06%N/
        016325      105     114     064
        016330      072     040     045
        016333      117     066     045
        016336      101     040     123
        016341      105     114     066
        016344      072     040     045
        016347      117     066     045
        016352      116     000
    135 016354      045     101     105  FMG3:   .ASCIZ  /%AERROR IN SUBROUTINE CALLED AT PC: %06%N/
        016357      122     122     117
        016362      122     040     111
        016365      116     040     123
        016370      125     102     122
        016373      117     125     124
        016376      111     116     105
        016401      040     103     101
        016404      114     114     105
        016407      104     040     101
        016412      124     040     120
        016415      103     072     040
        016420      045     117     066
        016423      045     116     000
    136 016426      045     101     103  FMG4:   .ASCIZ  /%ACPU MICROTEST FAILED%N/
        016431      120     125     040
        016434      115     111     103
        016437      122     117     124
        016442      105     123     124
        016445      040     106     101
        016450      111     114     105
        016453      104     045     116
        016456      000
```

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    137 016457     045     101     114  FMG5:    .ASCIZ  /%ALU. MICROTEST FAILED%N/
        016462     125     056     040
        016465     115     111     103
        016470     122     117     124
        016473     105     123     124
        016476     040     106     101
        016501     111     114     105
        016504     104     045     116
        016507     000
    138 016510     045     101     116  FMG7:    .ASCIZ  /%ANAKS-NO BUFFER  RCV: %D3%A SENT: %D3%N/
        016513     101     113     123
        016516     055     116     117
        016521     040     102     125
        016524     106     106     105
        016527     122     040     040
        016532     122     103     126
        016535     072     040     045
        016540     104     063     045
        016543     101     040     123
        016546     105     116     124
        016551     072     040     045
        016554     104     063     045
        016557     116     000
    139 016561     045     101     116  FMG8:    .ASCIZ  /%ANAKS-BAD DATA   RCV: %D3%A SENT: %D3%N/
        016564     101     113     123
        016567     055     102     101
        016572     104     040     104
        016575     101     124     101
        016600     040     040     040
        016603     122     103     126
        016606     072     040     045
        016611     104     063     045
        016614     101     040     123
        016617     105     116     124
        016622     072     040     045
        016625     104     063     045
        016630     116     000
    140 016632     045     101     116  FMG9:    .ASCIZ  /%ANAKS-BAD HEADER RCV: %D3%A SENT: %D3%N/
        016635     101     113     123
        016640     055     102     101
        016643     104     040     110
        016646     105     101     104
        016651     105     122     040
        016654     122     103     126
        016657     072     040     045
        016662     104     063     045
        016665     101     040     123
        016670     105     116     124
        016673     072     040     045
        016676     104     063     045
        016701     116     000
    141 016703     045     101     122  FMG10:   .ASCIZ  /%AREPS-RCV: %D3%A SENT: %D3%N/
        016706     105     120     123
        016711     055     122     103
        016714     126     072     040
        016717     045     104     063
        016722     045     101     040
```

```
        016725    123    105    116
        016730    124    072    040
        016733    045    104    063
        016736    045    116    000
    142 016741    045    101    130  FMG11:  .ASCIZ  /%AXMIT BACC OUT COMMAND%N/
        016744    115    111    124
        016747    040    102    101
        016752    103    103    040
        016755    117    125    124
        016760    040    103    117
        016763    115    115    101
        016766    116    104    045
        016771    116    000
    143 016773    045    101    122  FMG12:  .ASCIZ  /%ARCV BACC OUT COMMAND%N/
        016776    103    126    040
        017001    102    101    103
        017004    103    040    117
        017007    125    124    040
        017012    103    117    115
        017015    115    101    116
        017020    104    045    116
        017023    000
    144 017024    045    101    101  FMG13:  .ASCIZ  /%AACTUAL   ADDR. %O6%A ACTUAL COUNT   %D5%N/
        017027    103    124    125
        017032    101    114    040
        017035    040    040    101
        017040    104    104    122
        017043    056    040    045
        017046    117    066    045
        017051    101    040    101
        017054    103    124    125
        017057    101    114    040
        017062    103    117    125
        017065    116    124    040
        017070    040    040    045
        017073    104    065    045
        017076    116    000
    145 017100    045    101    105  FMG14:  .ASCIZ  /%AEXPECTED ADDR. %O6%A EXPECTED COUNT %D5%N/
        017103    130    120    105
        017106    103    124    105
        017111    104    040    101
        017114    104    104    122
        017117    056    040    045
        017122    117    066    045
        017125    101    040    105
        017130    130    120    105
        017133    103    124    105
        017136    104    040    103
        017141    117    125    116
        017144    124    040    045
        017147    104    065    045
        017152    116    000
    146 017154    045    101    105  FMG15:  .ASCIZ  /%AEXPECTED ADDR. %O6%N/
        017157    130    120    105
        017162    103    124    105
        017165    104    040    101
        017170    104    104    122
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        017173    056    040    045
        017176    117    066    045
        017201    116    000
    147 017203    045    101    122  FMG16:  .ASCIZ  /%ARCV CHAR. COUNT %D5%A XMIT CHAR. COUNT %D5%N/
        017206    103    126    040
        017211    103    110    101
        017214    122    056    040
        017217    103    117    125
        017222    116    124    040
        017225    045    104    065
        017230    045    101    040
        017233    130    115    111
        017236    124    040    103
        017241    110    101    122
        017244    056    040    103
        017247    117    125    116
        017252    124    040    045
        017255    104    065    045
        017260    116    000
    148 017262    045    101    122  FMG17:  .ASCIZ  /%ARCV BUFFER AT %O6%A XMIT BUFFER AT %O6%N/
        017265    103    126    040
        017270    102    125    106
        017273    106    105    122
        017276    040    101    124
        017301    040    045    117
        017304    066    045    101
        017307    040    130    115
        017312    111    124    040
        017315    102    125    106
        017320    106    105    122
        017323    040    101    124
        017326    040    045    117
        017331    066    045    116
        017334    000
    149 017335    045    101    104  FMG18:  .ASCIZ  /%ADATA DIFFERS AT RCV ADDR. %O6%A AND XMIT ADDR. %O6%N/
        017340    101    124    101
        017343    040    104    111
        017346    106    106    105
        017351    122    123    040
        017354    101    124    040
        017357    122    103    126
        017362    040    101    104
        017365    104    122    056
        017370    040    045    117
        017373    066    045    101
        017376    040    101    116
        017401    104    040    130
        017404    115    111    124
        017407    040    101    104
        017412    104    122    056
        017415    040    045    117
        017420    066    045    116
        017423    000
    150 017424    045    101    104  FMG19:  .ASCIZ  /%ADEVICE NOT DMR%N/
        017427    105    126    111
        017432    103    105    040
        017435    116    117    124
```

```
        017440    040    104    115
        017443    122    045    116
        017446    000
    151 017447    045    101    102  FMG21:  .ASCIZ  /%ABUFFER STATUS%N%A# OF BUFFERS:%D3%N/
        017452    125    106    106
        017455    105    122    040
        017460    123    124    101
        017463    124    125    123
        017466    045    116    045
        017471    101    043    040
        017474    117    106    040
        017477    102    125    106
        017502    106    105    122
        017505    123    072    045
        017510    104    063    045
        017513    116    000
    152 017515    045    101    102  FMG22:  .ASCIZ  /%ABUFFER SIZE: %D5%N/
        017520    125    106    106
        017523    105    122    040
        017526    123    111    132
        017531    105    072    040
        017534    045    104    065
        017537    045    116    000
    153 017542    045    101    111  FMG23:  .ASCIZ  /%AIN  - RCV ASSIGNED:%D3%A   XMIT ASSIGNED:%D3%N/
        017545    116    040    040
        017550    055    040    122
        017553    103    126    040
        017556    101    123    123
        017561    111    107    116
        017564    105    104    072
        017567    045    104    063
        017572    045    101    040
        017575    040    040    130
        017600    115    111    124
        017603    040    101    123
        017606    123    111    107
        017611    116    105    104
        017614    072    045    104
        017617    063    045    116
        017622    000
    154 017623    045    101    117  FMG24:  .ASCIZ  /%AOUT - RCV RETURNED:%D3%A   XMIT RETURNED:%D3%N/
        017626    125    124    040
        017631    055    040    122
        017634    103    126    040
        017637    122    105    124
        017642    125    122    116
        017645    105    104    072
        017650    045    104    063
        017653    045    101    040
        017656    040    040    130
        017661    115    111    124
        017664    040    122    105
        017667    124    125    122
        017672    116    105    104
        017675    072    045    104
        017700    063    045    116
        017703    000
```

```
    155
    156 017704     124     111     115  EMG1:   .ASCIZ  /TIME OUT/
        017707     105     040     117
        017712     125     124     000
    157 017715     124     111     115  EMG2:   .ASCIZ  /TIME OUT - DURING INTERRUPT EXERCISE/
        017720     105     040     117
        017723     125     124     040
        017726     055     040     104
        017731     125     122     111
        017734     116     107     040
        017737     111     116     124
        017742     105     122     122
        017745     125     120     124
        017750     040     105     130
        017753     105     122     103
        017756     111     123     105
        017761     000
    158 017762     105     130     120  EMG8:   .ASCIZ  /EXPECTED CONTROL OUT - NOT RECEIVED/
        017765     105     103     124
        017770     105     104     040
        017773     103     117     116
        017776     124     122     117
        020001     114     040     117
        020004     125     124     040
        020007     055     040     116
        020012     117     124     040
        020015     122     105     103
        020020     105     111     126
        020023     105     104     000
    159 020026     125     116     105  EMG9:   .ASCIZ  /UNEXPECTED CONTROL OUT/
        020031     130     120     105
        020034     103     124     105
        020037     104     040     103
        020042     117     116     124
        020045     122     117     114
        020050     040     117     125
        020053     124     000
    160 020055     105     122     122  EMG10:  .ASCIZ  /ERROR - MULTIPLE XMITS/
        020060     117     122     040
        020063     055     040     115
        020066     125     114     124
        020071     111     120     114
        020074     105     040     130
        020077     115     111     124
        020102     123     000
    161 020104     102     125     106  EMG11:  .ASCIZ  /BUFFER ADDR. ERROR/
        020107     106     105     122
        020112     040     101     104
        020115     104     122     056
        020120     040     105     122
        020123     122     117     122
        020126     000
    162 020127     103     110     101  EMG12:  .ASCIZ  /CHARACTER COUNT ERROR/
        020132     122     101     103
        020135     124     105     122
        020140     040     103     117
        020143     125     116     124
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        020146    040    105    122
        020151    122    117    122
        020154    000
    163 020155    105    122    122  EMG13:  .ASCIZ  /ERROR - MULTIPLE RCVS/
        020160    117    122    040
        020163    055    040    115
        020166    125    114    124
        020171    111    120    114
        020174    105    040    122
        020177    103    126    123
        020202    000
    164 020203    122    103    126  EMG14:  .ASCIZ  /RCVD EXTRA DATA/
        020206    104    040    105
        020211    130    124    122
        020214    101    040    104
        020217    101    124    101
        020222    000
    165 020223    104    101    124  EMG15:  .ASCIZ  /DATA ERROR/
        020226    101    040    105
        020231    122    122    117
        020234    122    000
    166 020236    125    116    105  EMG16:  .ASCIZ  /UNEXPECTED HALT RECEIVED/
        020241    130    120    105
        020244    103    124    105
        020247    104    040    110
        020252    101    114    124
        020255    040    122    105
        020260    103    105    111
        020263    126    105    104
        020266    000
    167 020267    103    117    116  EMG17:  .ASCIZ  /CONTROL IN PROBLEM - IN INTERRUPT ROUTINE/
        020272    124    122    117
        020275    114    040    111
        020300    116    040    120
        020303    122    117    102
        020306    114    105    115
        020311    040    055    040
        020314    111    116    040
        020317    111    116    124
        020322    105    122    122
        020325    125    120    124
        020330    040    122    117
        020333    125    124    111
        020336    116    105    000
    168 020341    123    120    125  EMG18:  .ASCIZ  /SPURIOUS RDO INTERRUPT/
        020344    122    111    117
        020347    125    123    040
        020352    122    104    117
        020355    040    111    116
        020360    124    105    122
        020363    122    125    120
        020366    124    000
    169 020370    115    070    062  EMG19:  .ASCIZ  /M8207 PROGRAM TIMER OUT OF RANGE/
        020373    060    067    040
        020376    120    122    117
        020401    107    122    101
        020404    115    040    124
```

```
        020407     111     115     105
        020412     122     040     117
        020415     125     124     040
        020420     117     106     040
        020423     122     101     116
        020426     107     105     000
    170                                     .EVEN
```

```
                                .SBTTL  LOAD DEVICE PROTECTION TABLE

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

 020432                                 BGNPROT
 020432                                                                                 L$PROT::

 020432  177777                         .WORD   -1              ;DON'T CHECK CSR ADDRESS
 020434  177777                         .WORD   -1              ;DON'T CHECK MASSBUS UNIT NUMBER
 020436  177777                         .WORD   -1              ;DON'T CHECK DRIVE NUMBER

 020440                                 ENDPROT
```

```
                                .SBTTL  INITIALIZE SECTION

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

020440                          BGNINIT
020440                                                                                  L$INIT::

020440                                  SETPRI  #PRI07          ;SET DIAGNOSTIC PRIORITY = 7
020440  012700  000340                                                                  MOV     #PRI07,R0
020444  104441                                                                          TRAP    C$SPRI
020446  010637  002370                  MOV     SP,PSTACK       ;STORE BASE LEVEL PROGRAM STACK POINTER
020452  005037  002372                  CLR     SUBRPC          ;CLEAR STORAGE WORD FOR SUBROUTINE PC CALL
020456  005037  002364                  CLR     ERROR           ;CLEAR ERROR FLAGS
020462  005037  002274                  CLR     RESUME          ;CLEAR FLAG USED TO ALLOW BASE IN - RESUME.
020466  005037  002276                  CLR     DMCMDE          ;CLEAR FLAG USED TO INDICATE DMC MODE
020472  005037  002376                  CLR     CLRNO           ;CLEAR WORD USED TO RUN MICRO TESTS ON
                                                                ;EVERY OTHER MASTER CLEAR.
020476  005037  002350                  CLR     NXMFLG          ;FLAG USED TO MARK A NXM DMR ADDRESS.
020502  005737  002264                  TST     FRSTIM          ;IS THIS THE TIME THROUGH AFTER LOAD?
020506  001005                          BNE     1$              ;IF NOT - ERROR TRAP VECTOR ALREADY SAVED
020510  012737  000001  002264          MOV     #1,FRSTIM       ;FLAG THAT WE'VE BEEN THRU THE 1ST TIME
020516  005037  002266                  CLR     FRSPAS          ;CLEAR COUNTER FOR # OF PASSES AFTER LOAD

020522                          1$:
020522                                  CLRVEC  #4              ;ENSURE VECTOR 4 IS IN NORMAL STATE.
020522  012700  000004                                                                  MOV     #4,R0
020526  104436                                                                          TRAP    C$CVEC

020530                                  READEF  #EF.START       ;IS THIS JUST STARTED?
020530  012700  000040                                                                  MOV     #EF.START,R0
020534  104447                                                                          TRAP    C$REFG
020536                                  BCOMPLETE STARST        ;IF YES - BRANCH.
020536  103416                                                                          BCS     STARST
020540                                  READEF  #EF.RESTART     ;IS THIS A RESTART ?
020540  012700  000037                                                                  MOV     #EF.RESTART,R0
020544  104447                                                                          TRAP    C$REFG
020546                                  BCOMPLETE STARST        ;IF YES - BRANCH.
020546  103412                                                                          BCS     STARST
020550                                  READEF  #EF.NEW         ;IS THIS A NEW PASS?
020550  012700  000035                                                                  MOV     #EF.NEW,R0
020554  104447                                                                          TRAP    C$REFG
020556                                  BCOMPLETE NEWST         ;IF YES - BRANCH
020556  103410                                                                          BCS     NEWST
020560                                  READEF  #EF.CONTINUE    ;IS THIS A CONTINUATION?
020560  012700  000036                                                                  MOV     #EF.CONTINUE,R0
020564  104447                                                                          TRAP    C$REFG
020566                                  BNCOMPLETE GETPRM       ;IF NOT - GET PARAMETERS
020566  103013                                                                          BCC     GETPRM
020570  000137  021476                  JMP     END             ;OTHERWISE - DON'T INITIALIZE.

020574                          STARST:
020574  005037  002270                  CLR     STARES          ;CLEAR THE FLAG TO SHOW START/RESTART.

020600                          NEWST:
```

```
 41 020600  012737  177777  002366          MOV     #-1,LOGDEV       ;INITIALIZE LOGICAL UNIT NUMBER.
 42 020606  005237  002266                  INC     FRSPAS           ;INCREMENT # OF PASSES AFTER LOAD.
 43 020612  005237  002270                  INC     STARES           ;INCREMENT # OF PASSES SINCE START/RESTART.
 44 020616                          GETPRM:
 45 020616  005237  002366                  INC     LOGDEV           ;NEXT LOGICAL UNIT TO BE TESTED
 46 020622  023737  002366  002012          CMP     LOGDEV,L$UNIT    ;IS THE MAXIMUM UNIT # EXCEEDED?
 47 020630  002363                          BGE     NEWST            ;IF YES - DO A NEW START
 48 020632                                  GPHARD  LOGDEV,R1        ;GET THE P-TABLE POINTER INTO R1
    020632  013700  002366                                                                   MOV     LOGDEV,R0
    020636  104442                                                                           TRAP    C$GPHRD
    020640  010001                                                                           MOV     R0,R1
 49 020642                                  BNCOMPLETE  GETPRM       ;IF NOT AVAILABLE, GE THE NEXT ONE
    020642  103365                                                                           BCC     GETPRM
 50 020644  012137  002252                  MOV     (R1)+,WTYPE      ;MICROPROCESSOR TYPE
 51 020650  011100                          MOV     (R1),R0          ;SAVE THE ADDRESS
 52 020652  032700  000007                  BIT     #7,R0            ;DOES THIS DEVICE ADDRESS END IN NON-ZERO?
 53 020656  001414                          BEQ     10$              ;IF NOT - OK (76XXX0)
 54 020660  042711  000007                  BIC     #7,(R1)          ;MAKE IT 76XXX0
 55 020664                                  PRINTB  #FINIT1,(R1),R0  ;INFORM THE USER
    020664  010046                                                                           MOV     R0,-(SP)
    020666  011146                                                                           MOV     (R1),-(SP)
    020670  012746  021500                                                                   MOV     #FINIT1,-(SP)
    020674  012746  000003                                                                   MOV     #3,-(SP)
    020700  010600                                                                           MOV     SP,R0
    020702  104414                                                                           TRAP    C$PNTB
    020704  062706  000010                                                                   ADD     #10,SP
 56 020710                          10$:
 57 020710  011137  002232                  MOV     (R1),CSR         ;CSR ADDRESS
 58 020714  011137  002242                  MOV     (R1),BSEL1
 59 020720  005237  002242                  INC     BSEL1            ;HIGH BYTE ADDRESS OF CSR
 60 020724  011137  002234                  MOV     (R1),SEL2
 61 020730  062737  000002  002234          ADD     #2,SEL2          ;CONTROL OUT REGISTER ADDRESS
 62 020736  011137  002244                  MOV     (R1),BSEL3
 63 020742  062737  000003  002244          ADD     #3,BSEL3         ;HIGH BYTE OF SEL2
 64 020750  011137  002236                  MOV     (R1),SEL4
 65 020754  062737  000004  002236          ADD     #4,SEL4          ;PORT REG (SEL 4) ADDRESS
 66 020762  011137  002246                  MOV     (R1),BSEL5
 67 020766  062737  000005  002246          ADD     #5,BSEL5         ;HIGH BYTE OF SEL4
 68 020774  011137  002240                  MOV     (R1),SEL6
 69 021000  062737  000006  002240          ADD     #6,SEL6          ;PORT REG (SEL 6) ADDRESS
 70 021006  012137  002250                  MOV     (R1)+,BSEL7
 71 021012  062737  000007  002250          ADD     #7,BSEL7         ;HIGH BYTE OF SEL6
 72 021020  011100                          MOV     (R1),R0          ;GET VECTOR
 73 021022  032700  000007                  BIT     #7,R0            ;DOES THIS VECTOR END IN NON-ZERO?
 74 021026  001414                          BEQ     11$              ;IF NOT - OK (XX0)
 75 021030  042711  000007                  BIC     #7,(R1)          ;MAKE IT XX0
 76 021034                                  PRINTB  #FINIT2,(R1),R0  ;INFORM THE USER
    021034  010046                                                                           MOV     R0,-(SP)
    021036  011146                                                                           MOV     (R1),-(SP)
    021040  012746  021567                                                                   MOV     #FINIT2,-(SP)
    021044  012746  000003                                                                   MOV     #3,-(SP)
    021050  010600                                                                           MOV     SP,R0
    021052  104414                                                                           TRAP    C$PNTB
    021054  062706  000010                                                                   ADD     #10,SP
 77 021060                          11$:
 78 021060  011137  002226                  MOV     (R1),DMRVEC      ;RCV. VECTOR
 79 021064  011137  002230                  MOV     (R1),DMTVEC      ;TRANSMIT VECTOR
```

```
021070  011100                          MOV     (R1),R0         ;RCV. VECTOR
021072  105060  000003                  CLRB    3(R0)           ;CLEAR HI BYTE OF PSW FOR RCV. VECTOR.
021076  105060  000007                  CLRB    7(R0)           ;CLEAR HI BYTE OF PSW FOR XMIT. VECTOR.
                                                                ;THIS WILL ENSURE THAT WE DON'T PICK
                                                                ;UP ANY UNEXPECTED BITS IN PROCESSORS
                                                                ;WHICH USE BITS 11-15 OF THE PSW.  IE
                                                                ;IF BIT 11 IS SET IN AN 11/70 ANOTHER
                                                                ;REGISTER SET MAY BE USED.
021102  062737  000004  002230          ADD     #4,DMTVEC       ;ADJUST XMIT VECTOR

                                                                ;SET UP ISRS FOR DMR. INTERRUPTS ENABLED IN
                                                                ;TESTS 15-19.

021110                                  SETVEC  DMRVEC,#INISR,#PRI05    ;INPUT ISR
021110  012746  000240                                                          MOV     #PRI05,-(SP)
021114  012746  022052                                                          MOV     #INISR,-(SP)
021120  013746  002226                                                          MOV     DMRVEC,-(SP)
021124  012746  000003                                                          MOV     #3,-(SP)
021130  104437                                                                  TRAP    C$SVEC
021132  062706  000010                                                          ADD     #10,SP
021136                                  SETVEC  DMTVEC,#OUTISR,#PRI05   ;OUTPUT ISR
021136  012746  000240                                                          MOV     #PRI05,-(SP)
021142  012746  023134                                                          MOV     #OUTISR,-(SP)
021146  013746  002230                                                          MOV     DMTVEC,-(SP)
021152  012746  000003                                                          MOV     #3,-(SP)
021156  104437                                                                  TRAP    C$SVEC
021160  062706  000010                                                          ADD     #10,SP

021164  062701  000014                  ADD     #14,R1          ;INCR. P-TABLE POINTER.
021170  012137  002254                  MOV     (R1)+,DMTURN    ;TURNAROUND


021174  013700  002224                  MOV     SPEED,R0        ;GET THE SOFTWARE P-TABLE VALUE GIVEN
                                                                ;BY THE USER


021200                          13$:
021200  012701  000002                  MOV     #2,R1           ;GET FIRST TIMER VALUE
021204  012702  000012                  MOV     #10.,R2         ;GET SECOND TIMER VALUE
021210                          14$:
021210  006301                          ASL     R1              ; TIMER VALUES X 2
021212  006302                          ASL     R2
021214  005300                          DEC     R0              ; DEC SPEED VARIABLE
021216  001374                          BNE     14$             ; CONTINUE UNTIL DONE INCREASING WAIT VALUES

021220  010137  002312                  MOV     R1,WAIT1        ;SAVE TIMER VALUE FOR $WAIT
021224  006201                          ASR     R1              ;HALF THAT VALUE
021226  006201                          ASR     R1              ;HALF IT AGAIN.
021230  010137  002314                  MOV     R1,WAIT2        ;SAVE TIMER VALUE FOR $MSCLR AND $CLRQI
                                                                ;SUBROUTINES.
021234  010237  002316                  MOV     R2,WAIT3        ;TIMER VALUE FOR $INOUT SUBROUTINE.

                                                                ;CHECK TURNAROUND.
021240  012737  000333  002304          MOV     #333,AX3        ;MASK FOR AX3-15 - BIT CLEARED WILL
                                                                ;BE THE INTERFACE SELECTED.
021246  022737  000001  002254          CMP     #1,DMTURN       ;IS V.35 REQUESTED?
021254  001004                          BNE     20$             ;IF NOT - CONTINUE
```

```
021256  042737  000020  002304          BIC     #BIT4,AX3       ;SELECT V.35
021264  000427                          BR      30$
021266                          20$:
021266  022737  000002  002254          CMP     #2,DMTURN       ;IS INTEGRAL REQUESTED?
021274  001004                          BNE     22$             ;IF NOT - CONTINUE.
021276  042737  000010  002304          BIC     #BIT3,AX3       ;SELECT INTEGRAL MODEM.
021304  000417                          BR      30$
021306                          22$:
021306  022737  000003  002254          CMP     #3,DMTURN       ;IS EIA REQUESTED?
021314  001004                          BNE     25$             ;IF NOT - CONTINUE.
021316  042737  000100  002304          BIC     #BIT6,AX3       ;SELECT EIA(XYZ).
021324  000407                          BR      30$
021326                          25$:
021326  022737  000004  002254          CMP     #4,DMTURN       ;IS RS422 REQUESTED?
021334  001007                          BNE     35$             ;IF NOT, DON'T ALLOW INTERFACE CHANGE.
021336  042737  000200  002304          BIC     #BIT7,AX3       ;SELECT RS422.
021344                          30$:
021344  012737  000001  002262          MOV     #1,INFACE       ;SET FLAG THAT ALLOWS INTERFACE CHANGE.
021352  000404                          BR      40$
021354                          35$:
021354  005037  002262                  CLR     INFACE          ;CLEAR FLAG - NO INTERFACE CHANGE.
021360  005037  002304                  CLR     AX3             ;CLEAR AX3 BITS
021364                          40$:
                                                                ;*****************************************
021364  005737  002310                  TST     MANUF           ;IS THIS A SPECIAL MANUFACTURING TEST CON.?
021370  001410                          BEQ     42$             ;IF NOT - SET MAINT BIT ONLY FOR MODEM LOOP
                                                                ;*****************************************
021372  022737  000001  002254          CMP     #1,DMTURN       ;IS THIS V.35 WITH SPECIAL CONNECTOR?
021400  001430                          BEQ     45$             ;IF YES - SET WRITE MAINT. BIT
021402  022737  000003  002254          CMP     #3,DMTURN       ;IS THIS EIA WITH SPECIAL CONNECTOR?
021410  001424                          BEQ     45$             ;IF YES - SET WRITE MAINT. BIT
021412                          42$:
021412  022737  000006  002254          CMP     #6,DMTURN       ;IS THIS LOCAL LOOP?
021420  001420                          BEQ     45$             ;IF YES - SET WRITE MAINT. BIT.
021422  022737  000007  002254          CMP     #7,DMTURN       ;IS THIS REMOTE LOOP?
021430  001020                          BNE     50$             ;IF NOT - CLEAR MAINT. BIT FLAG
021432  022737  000001  002270          CMP     #1,STARES       ;IS THIS THE FIRST PASS?
021440  001010                          BNE     45$             ;IF NOT - SKIP MESSAGE
021442                                  PRINTB  #FINIT3         ;WARN TO USE ONLY TESTS 17-19
021442  012746  021656                                                          MOV     #FINIT3,-(SP)
021446  012746  000001                                                          MOV     #1,-(SP)
021452  010600                                                                  MOV     SP,R0
021454  104414                                                                  TRAP    C$PNTB
021456  062706  000004                                                          ADD     #4,SP

021462                          45$:
021462  012737  000001  002306          MOV     #1,WMAINT       ;SET FLAG TO WRITE MODEM MAINTENANCE BITS.
021470  000402                          BR      END
021472                          50$:
021472  005037  002306                  CLR     WMAINT          ;CLEAR FLAG - DON'T WRITE MAINT. 1 OR 2.
021476                          END:
021476                          ENDINIT
021476                                                                  L10014:
021476  104411                                                                  TRAP    C$INIT
C21500     045     101     052  FINIT1: .ASCIZ  /%A** WARNING - WILL ASSUME ADDRESS %O6%A (NOT %O6%A)%N/
021503     052     040     127
021506     101     122     116
```

```
        021511    111    116    107
        021514    040    055    040
        021517    127    111    114
        021522    114    040    101
        021525    123    123    125
        021530    115    105    040
        021533    101    104    104
        021536    122    105    123
        021541    123    040    045
        021544    117    066    045
        021547    101    040    050
        021552    116    117    124
        021555    040    045    117
        021560    066    045    101
        021563    051    045    116
        021566    000
    173 021567    045    101    052  FINIT2: .ASCIZ  /%A** WARNING - WILL ASSUME VECTOR  %O3%A (NOT %O3%A)%N/
        021572    052    040    127
        021575    101    122    116
        021600    111    116    107
        021603    040    055    040
        021606    127    111    114
        021611    114    040    101
        021614    123    123    125
        021617    115    105    040
        021622    126    105    103
        021625    124    117    122
        021630    040    040    045
        021633    117    063    045
        021636    101    040    050
        021641    116    117    124
        021644    040    045    117
        021647    063    045    101
        021652    051    045    116
        021655    000
    174 021656    045    101    052  FINIT3: .ASCIZ  /%A** WITH REMOTE LOOPBACK USE TESTS 17 - 19 ONLY **%N/
        021661    052    040    127
        021664    111    124    110
        021667    040    122    105
        021672    115    117    124
        021675    105    040    114
        021700    117    117    120
        021703    102    101    103
        021706    113    040    125
        021711    123    105    040
        021714    124    105    123
        021717    124    123    040
        021722    061    067    040
        021725    055    040    061
        021730    071    040    117
        021733    116    114    131
        021736    040    052    052
        021741    045    116    000
    175                                .EVEN
```

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

 021744                         BGNAUTO
 021744                                                                                  L$AUTO::

 021744                                 SETVEC  #4,#NOXMEM,#PRI07 ;SET UP NON -EXISTENT MEMORY TRAP VECTOR.
 021744  012746  000340                                                                  MOV     #PRI07,-(SP)
 021750  012746  023572                                                                  MOV     #NOXMEM,-(SP)
 021754  012746  000004                                                                  MOV     #4,-(SP)
 021760  012746  000003                                                                  MOV     #3,-(SP)
 021764  104437                                                                          TRAP    C$SVEC
 021766  062706  000010                                                                  ADD     #10,SP
 021772  005037  002350                 CLR     NXMFLG          ;CLEAR FLAG THAT WILL BE SET IF NXM OCCURS.
 021776  005777  160230                 TST     @CSR            ;REFERENCE MEMORY ADDRESS FOR THE DEVICE
                                                                ;TO SEE IF IT EXISTS.

                                ;;*********************************************************************
                                ; IF THE DEVICE DOESN'T EXIST THE RE' _TANT 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.
                                ;;*********************************************************************

 022002                                 CLRVEC  #4              ;RETURN VECTOR 04 TO NORMAL STATE
 022002  012700  000004                                                                  MOV     #4,R0
 022006  104436                                                                          TRAP    C$CVEC
 022010  005737  002350                 TST     NXMFLG          ;DID NXM OCCUR?
 022014  001406                         BEQ     1$              ;IF NOT EXIT
 022016                                 DODU    LOGDEV          ;DROP THE DEVICE
 022016  013700  002366                                                                  MOV     LOGDEV,R0
 022022  104451                                                                          TRAP    C$DODU
 022024                                 DOCLN                   ;DO CLEAN UP - FORCE BACK TO INIT CODE.
 022024  104444                                                                          TRAP    C$DCLN
 022026  005037  002350                 CLR     NXMFLG          ;RESTORE FLAG.
 022032                         1$:
 022032                         ENDAUTO
 022032                                                                          L10015:
 022032  104461                                                                          TRAP    C$AUTO
```

```
                                .SBTTL  CLEANUP CODING SECTION

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

022034                          BGNCLN
022034                                                                                          L$CLEAN::

022034  005737  002350                  TST     NXMFLG          ;WAS THERE A NXM ERROR?
022040  001003                          BNE     10$             ;IF YES - SKIP MASTER CLEAR.
022042  012777  040000  160162          MOV     #MCLR,@SEL0     ;ISSUE A MASTER CLEAR.
022050                          10$:

022050                          ENDCLN
022050                                                                                          L10016:
022050  104412                                                                                          TRAP    C$CLEAN
```

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

022052                          BGNSRV  INISR                   ;INPUT INTERRUPT SERVICE ROUTINE
022052                                                                                  INISR::
022052  010046                          MOV     R0,-(SP)        ;SAVE R0
022054  010146                          MOV     R1,-(SP)        ;SAVE R1
022056  017701  160150                  MOV     @SEL0,R1        ;SAVE THE CONTROL IN COMMAND.
022062  042701  177760                  BIC     #177760,R1      ;CLEAR ALL BUT THE COMMAND BITS (0-3)
022066  032777  000200  160136          BIT     #RDI,@SEL0      ;IS RDI SET
022074  001002                          BNE     1$              ;IF YES - PROCESS INPUT COMMAND.
022076  000137  022606                  JMP     NEXT            ;ISSUE NEXT INPUT COMMAND.
                                        ;*****************************************************************
                                        ;
                                        ; PROCESS INPUT COMMAND
                                        ;
                                        ;*****************************************************************
022102                          1$:
022102  022701  000004                  CMP     #BACCR,R1       ;IS THIS A RCV. BA/CC?
022106  001533                          BEQ     29$             ;BR IF YES.
022110  022701  000000                  CMP     #BACCT,R1       ;IS THIS A XMIT. BA/CC?
022114  001537                          BEQ     30$             ;BR IF YES.
022116  022701  000003                  CMP     #BASEI,R1       ;IS THIS A BASE IN?
022122  001461                          BEQ     20$             ;BR IF YES.
022124  022701  000001                  CMP     #CNTRL,R1       ;IS THIS A CONTROL IN?
022130  001444                          BEQ     15$             ;BR IF YES.
022132  022701  000005                  CMP     #WMODEM,R1      ;IS THIS A WRITE MODEM?
022136  001417                          BEQ     10$             ;BR IF YES.
022140  022701  000015                  CMP     #INTER,R1       ;IS THIS AN INTERFACE WRITE.
022144  001410                          BEQ     5$              ;BR IF YES.
022146  022701  000002                  CMP     #HLT,R1         ;IS THIS A HALT?
022152  001572                          BEQ     70$             ;EXIT - IF YES (NOTHING TO SET UP)
022154                                  ERRDF   17,EMG17,ERRG2  ;PROBLEM IF IT'S NOT ONE OF THE ABOVE.
022154  104455                                                                          TRAP    C$ERDF
022156  000021                                                                          .WORD   17
022160  020267                                                                          .WORD   EMG17
022162  015112                                                                          .WORD   ERRG2
022164  000565                          BR      70$             ;EXIT

022166                          5$:
                                        ;
                                        ; WRITE AX3-15
                                        ;
022166  113777  002304  160054          MOVB    AX3,@BSEL7      ;WRITE NECESSARY AX3-15 INTERFACE.
                                                                ;AX3 HAS BEEN DETERMINED IN THE INIT
                                                                ;CODE.
022174  000561                          BR      70$


022176                          10$:
                                        ;
                                        ; MODEM WRITE
```

```
                                                ;
022176  022737  000006  002254                  CMP     #LLOOP,DMTURN   ;IS LOCAL MODEM LOOPBACK DESIRED?
022204  001007                                  BNE     11$             ;BR IF NOT
022206  042777  000004  160024                  BIC     #MAINT2,@SEL6   ;ENSURE REMOTE LOOPBACK IS CLEAR.
022214  052777  000110  160016                  BIS     #DTR!MAINT1,@SEL6 ;SET MAINTENANCE 1 BIT AND DTR.
022222  000546                                  BR      70$
022224                                  11$:
022224  042777  000010  160006                  BIC     #MAINT1,@SEL6   ;ENSURE LOCAL LOOPBACK IS CLEAR.
022232  052777  000104  160000                  BIS     #DTR.MAINT2,@SEL6 ;SET MAINTENANCE 2 BIT AND DTR.
022240  000537                                  BR      70$             ;CLEAR RQI
022242                                  15$:
                                                ;
                                                ;CONTROL IN
                                                ;
022242  005737  002300                          TST     MNTMDE          ;IS MAINTENANCE MODE REQUESTED
022246  001404                                  BEQ     17$             ;BR IF NOT
022250  012777  000400  157762                  MOV     #MAINT,@SEL6    ;REQUEST MAINT. MODE
022256  000530                                  BR      70$
022260                                  17$:
022260  005077  157754                          CLR     @SEL6           ;FULL DUPLEX - NON-MAINT. MODE.
022264  000525                                  BR      70$
022266                                  20$:
                                                ;
                                                ;BASE IN
                                                ;
022266  012777  002636  157742                  MOV     #BASE,@SEL4     ;BASE TABLE ADDRESS.

022274  005737  002276                          TST     DMCMDE          ;ARE WE IN DMC MODE?
022300  001004                                  BNE     22$             ;BR IF YES
022302  012777  000522  157730                  MOV     #DMR,@SEL6      ;DMR MODE.
022310  000402                                  BR      23$             ;CHECK LOOPBACK.
022312                                  22$:
022312  005077  157722                          CLR     @SEL6           ;DMC MODE
022316                                  23$:
022316  005737  002272                          TST     START           ;IS THIS THE FIRST BASE IN?
022322  001004                                  BNE     24$             ;IF NOT - SET RESUME.
022324  052777  000100  157702                  BIS     #IEO,@SEL2      ;ON FIRST BASE IN SET RDO INT.ENABLE.
022332  000406                                  BR      25$
022334                                  24$:
022334  052777  010000  157676                  BIS     #RES,@SEL6      ;SET RESUME
022342  012737  177777  002356                  MOV     #-1,RESFLG      ;FLAG THAT THIS IS A BASE IN RESUME COMMAND
                                                                        ;(THIS WILL BE USED LATER IN THIS ISR TO
                                                                        ;DECIDE WHAT THE NEXT COMMAND WILL BE)
022350                                  25$:
022350  005737  002254                          TST     DMTURN          ;IS INTERNAL LOOPACK REQUESTED?
022354  001004                                  BNE     27$             ;BR IF NOT - CLEAR LU LOOP
022356  052777  004000  157646                  BIS     #LPLU,@SEL0     ;SET THE LINE UNIT LOOPBACK BIT
022364  000465                                  BR      70$             ;CLEAR RQI AND EXIT.
022366                                  27$:
022366  042777  004000  157636                  BIC     #LPLU,@SEL0     ;CLEAR LINE UNIT LOOPBACK (CONNECTOR OR
                                                                        ;CABLE)
022374  000461                                  BR      70$             ;CLEAR RQI AND EXIT

                                                ;
                                                ;BA/CC IN RCV
                                                ;
022376                                  29$:
```

```
022376  005337  002326                  DEC     INRCV           ;DECREMENT COUNTER
022402  012277  157630                  MOV     (R2)+,@SEL4     ;RCV BUFFER ADDRESS
022406  012277  157626                  MOV     (R2)+,@SEL6     ;RCV CHARACTER COUNT
022412  000406                          BR      40$
                                        ;
                                        ;BA/CC IN XMIT
                                        ;
022414                          30$:
022414  005337  002330                  DEC     INXMIT          ;DECREMENT COUNTER
022420  012377  157612                  MOV     (R3)+,@SEL4     ;XMIT BUFFER ADDRESS.
022424  012377  157610                  MOV     (R3)+,@SEL6     ;XMIT CHARACTER COUNT.
022430                          40$:
022430  005737  002302                  TST     MMANAG          ;ARE THE BUFFERS MEMORY MANAGED?
022434  001441                          BEQ     70$             ;IF NOT SKIP CONVERTING VIRTUAL ADDR
                                                                ;TO PHYSICAL ADDR.
022436  052777  040000  157574          BIS     #BIT14,@SEL6    ;SET BIT 16 OF PHSICAL ADDRESS (I.E.
                                                                ;VIRTUAL ADDR 60000 = PHYSICAL ADDR 200000
022444  010246                          MOV     R2,-(SP)        ;SAVE R2 (NEXT RCV BUFFER ADDRESS)
022446  017702  157564                  MOV     @SEL4,R2        ;SAVE THE VIRTUAL ADDRESS.
022452  042777  160000  157556          BIC     #160000,@SEL4   ;CLEAR BITS CORRESPONDING TO THE PAGE #
                                                                ;IN THE VIRTUAL ADDRESS.
022460  042702  017777                  BIC     #17777,R2       ;SAVE ONLY THE PAGE # IN THE SAVED ADDR.
022464  022702  060000                  CMP     #60000,R2       ;IS THIS PAGE 3?
022470  001421                          BEQ     44$             ;IF YES, PHYSICAL ADDRESS CALCULATED
022472  022702  100000                  CMP     #100000,R2      ;IS THIS PAGE 4?
022476  001004                          BNE     41$             ;IF NOT SEE IF IT'S PAGE 4 OR 5
022500  052777  020000  157530          BIS     #BIT13,@SEL4    ;SET BIT FOR PHYSICAL ADDR (I.E. VIRTUAL
                                                                ;ADDR 100000 = PHYSICAL ADDR. 220000
022506  000412                          BR      44$
022510                          41$:
022510  022702  120000                  CMP     #120000,R2      ;IS THIS PAGE 4?
022514  001004                          BNE     42$             ;IF NOT, MUST BE PAGE 5.
022516  052777  040000  157512          BIS     #BIT14,@SEL4    ;SET BIT FOR PHYSICAL ADDR (I.E. VIRTUAL
                                                                ;ADDR 120000 = PHYSICAL ADDR. 240000
022524  000403                          BR      44$
022526                          42$:
022526  052777  060000  157502          BIS     #BIT14!BIT13,@SEL4 ;SET BIT FOR PHYSICAL ADDR (I.E. VIRTUAL
                                                                ;ADDR 140000 = PHYSICAL ADDR. 260000
022534                          44$:
022534  012602                          MOV     (SP)+,R2        ;RESTORE R2 (NEXT RCV BUFFER ADDRESS)
022536  000400                          BR      70$             ;CLEAR RQI AND EXIT


022540                          70$:
022540  010137  002362                  MOV     R1,LAST         ;SAVE THE INPUT COMMAND (USED
                                                                ;TO DETERMINE NEXT INPUT COMMAND)
022544  005737  002276                  TST     DMCMDE          ;ARE WE IN DMC MODE?
022550  001011                          BNE     80$             ;IF YES - DON'T USE IECLR
                                                                ;NOTE: INTERRUPT CAPABILITY FOR RQI
                                                                ;CLEAR IS ONLY AVAILABLE IN DMR MODE.
022552  012601                          MOV     (SP)+,R1        ;RESTORE R1
022554  012600                          MOV     (SP)+,R0        ;RESTORE R0
022556  052777  000020  157446          BIS     #IECLR,@SEL0    ;SET INTERRUPT ENABLE FOR RDI CLEAR.
022564  042777  000040  157440          BIC     #RQI,@SEL0      ;CLEAR RQI - INT. GENERATED WHEN RDI
                                                                ;CLEARS IN RESPONSE.
022572  000002                          RTI                     ;RETURN AND WAIT FOR RQI CLEAR INTERRUPT.
```

```
022574                          80$:
022574  042777  000020  157430          BIC     #IECLR,@SELO    ;ENSURE INTERRUPT ENABLE FOR RDI CLEAR IS CLR.
022602                                  CALL    $CLRQI          ;CLEAR RQI AND WAIT FOR RDI TO CLEAR.
                                        ;*******************************************************************
                                        ;
                                        ; RDI CLEAR - DETERMINE NEXT INPUT COMMAND.
                                        ;
                                        ;*******************************************************************
022606                          NEXT:
022606  022737  000002  002362          CMP     #HLT,LAST       ;WAS THE LAST COMMAND A HALT?
022614  001015                          BNE     110$            ;IF NOT - PROCEED.
022616  005737  002274                  TST     RESUME          ;ARE WE TESTING RESUME?
022622  001541                          BEQ     170$            ;IF NOT, DON'T ISSUE ANOTHER COMMAND.
022624  005737  002352                  TST     INFLAG          ;INPUT BUFFER DONE?
022630  001403                          BEQ     106$            ;IF NOT, BASE IN.
022632  005737  002354                  TST     OUTFLG          ;OUTPUT BUFFER DONE?
022636  001133                          BNE     170$            ;IF YES, DON'T ISSUE ANOTHER COMMAND.
022640                          106$:
022640  112777  000143  157364          MOVB    #IESET!RQI!BASEI,@SELO ;ISSUE A BASE IN.
022646  000527                          BR      170$            ;EXIT
022650                          110$:
022650  005737  002276                  TST     DMCMDE          ;ARE WE IN DMC MODE?
022654  001032                          BNE     130$            ;IF YES - DON'T BOTHER CHECKING MODEM
                                                                ;WRITE AND AX3-15 WRITE COMMANDS
022656  022737  000003  002362          CMP     #BASEI,LAST     ;WAS THE LAST COMMAND A BASE IN ?
022664  001405                          BEQ     115$            ;IF YES - SEE IF INTER. OR M. WRITE IS NEEDED?
022666  022737  000015  002362          CMP     #INTER,LAST     ;WAS THE LAST COMMAND AN AX3-15 WRITE?
022674  001413                          BEQ     117$
022676  000421                          BR      130$            ;KEEP CHECKING FOR NEXT COMMAND.
022700                          115$:
022700  005737  002262                  TST     INFACE          ;IS AN AX3-15 WRITE NEEDED?
022704  001407                          BEQ     117$            ;BR IF NOT
022706  005737  002272                  TST     START           ;WAS CONTROL IN ISSUED?
022712  001004                          BNE     117$            ;IF YES - NO NEED TO REWRITE AX3-15. THIS
                                                                ;SHOULD HAVE BEEN DONE ON THE 1ST BASE IN.
022714  112777  000155  157310          MOVB    #IESET!RQI!INTER,@BSELO ;ISSUE AN AX3-15 WRITE COMMAND.
022722  000501                          BR      170$
022724                          117$:
022724  005737  002306                  TST     WMAINT          ;WRITE MAINT 1 OR 2?
022730  001404                          BEQ     130$            ;IF NOT - SKIP WRITE MODEM COMMAND.
022732  112777  000145  157272          MOVB    #IESET!RQI!WMODEM,@BSELO ;ISSUE A MODEM WRITE COMMAND
022740  000472                          BR      170$
022742                          130$:
022742  005737  002272                  TST     START           ;WAS A CONTROL IN ISSUED?
022746  001006                          BNE     150$            ;IF YES - SKIP
022750  005237  002272                  INC     START           ;SET FLAG.
022754  112777  000141  157250          MOVB    #IESET!RQI!CNTRL,@BSELO ;ISSUE A CONTROL IN
022762  000461                          BR      170$
022764                          150$:
022764  005737  002326                  TST     INRCV           ;ARE ALL THE BA/CC IN RCVS DONE?
022770  001424                          BEQ     160$            ;IF YES - BR TO SEE IF XMITS DONE.
022772  005737  002274                  TST     RESUME          ;IS A TEST OF RESUME REQUESTED?
022776  001415                          BEQ     153$            ;BR IF NOT.
023000  032737  000001  002326          BIT     #BIT0,INRCV     ;IS THIS AN ODD COUNT?
023006  001411                          BEQ     153$            ;BR IF NOT.
023010  005737  002356                  TST     RESFLG          ;WAS THE LAST COMMAND A BASE IN RESUME?
023014  001004                          BNE     152$            ;IF YES, ISSUE BA/CC
```

```
                                                                        ;HALT - TO TEST RESUME.  NOTE: THIS WILL
                                                                        ;OCCUR ONLY WHEN RESUME IS REQUESTED,
                                                                        ;FOLLOWING EVERY OTHER BA/CC
                                                                        ;COMMAND  (NEVER FOLLOWING A RESUME)
023016  112777  000142  157206          MOVB    #IESET!RQI!HLT,@BSEL0 ;HALT IT
023024  000440                          BR      170$
023026                          152$:
023026  005037  002356                  CLR     RESFLG          ;CLEAR FLAG.
023032                          153$:
023032  112777  000144  157172          MOVB    #IESET!RQI!BACCR,@BSEL0 ;ISSUE A BA/CC IN RCV. COMMAND.
023040  000432                          BR      170$
023042                          160$:
023042  005737  002330                  TST     INXMIT          ;ARE ALL THE BA/CC IN XMITS DONE?
023046  001424                          BEQ     165$            ;IF YES, SET THE FLAG
023050  005737  002274                  TST     RESUME          ;IS A TEST OF RESUME REQUESTED?
023054  001415                          BEQ     163$            ;BR IF NOT.
023056  032737  000001  002330          BIT     #BIT0,INXMIT    ;IS THIS AN ODD COUNT?
023064  001411                          BEQ     163$            ;BR IF NOT.
023066  005737  002356                  TST     RESFLG          ;WAS THE LAST COMMAND A BASE IN RESUME?
023072  001004                          BNE     162$            ;IF YES, ISSUE BA/CC
                                                                        ;HALT - TO TEST RESUME.  NOTE: THIS WILL
                                                                        ;OCCUR ONLY WHEN RESUME IS REQUESTED,
                                                                        ;FOLLOWING EVERY OTHER BA/CC
                                                                        ;COMMAND  (NEVER FOLLOWING A RESUME)
023074  112777  000142  157130          MOVB    #IESET!RQI!HLT,@BSEL0 ;HALT IT
023102  000411                          BR      170$
023104                          162$:
023104  005037  002356                  CLR     RESFLG          ;CLEAR BASE IN RESUME FLAG.
023110                          163$:
023110  112777  000140  157114          MOVB    #IESET!RQI!BACCT,@BSEL0 ;ISSUE A BA/CC IN XMIT COMMAND.
023116  000403                          BR      170$
023120                          165$:
023120  012737  177777  002352          MOV     #-1,INFLAG      ;FLAG THAT ALL BA/CC INS DONE.

023126                          170$:
023126  012601                          MOV     (SP)+,R1        ;RESTORE R1
023130  012600                          MOV     (SP)+,R0        ;RESTORE R0

023132                          ENDSRV
023132                                                                  L10017:
023132  000002                                                                  RTI

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

023134                          BGNSRV  OUTISR                  ;OUTPUT INTERRUPT SERVICE ROUTINE
023134                                                                  OUTISR::
023134  010046                          MOV     R0,-(SP)        ;SAVE R0
023136  032777  000200  157070          BIT     #RDO,@SEL2      ;IS THE RDO OUT BIT SET?
023144  001006                          BNE     5$              ;IF YES - OK TO PROCEED.
                                                                        ;OTHERWISE REPORT SPURIOUS INTERRUPT
023146                                  ERRDF   18,EMG18,ERRG2
023146  104455                                                          TRAP    C$ERDF
023150  000022                                                          .WORD   18
023152  020341                                                          .WORD   EMG18
023154  015112                                                          .WORD   ERRG2
023156  000137  023530                  JMP     60$
```

```
023162                          5$:
023162  032777  000001  157044          BIT     #CNTRL,@SEL2    ;IS THIS A CONTROL OUT
023170  001436                          BEQ     20$             ;IF NOT - PROCESS BA/CC OUT
023172  032777  001000  157040          BIT     #HALTC,@SEL6    ;IS THIS CONTROL OUT A HALT?
023200  001013                          BNE     10$             ;IF IT IS - SEE IF WE SHOULD RESUME.
023202  032777  000040  157030          BIT     #DMRRUN,@SEL6   ;IS THIS DMR RUN MODE ACKNOWLEDGE?
023210  001407                          BEQ     10$             ;IF NOT - REPORT ERROR
023212  000137  023560                  JMP     65$             ;EXIT
023216                          7$:
023216                                  ERRDF   9,EMG9,ERRG2    ;UNEXPECTED CONTROL OUT.
023216  104455                                                                          TRAP    C$ERDF
023220  000011                                                                          .WORD   9
023222  020026                                                                          .WORD   EMG9
023224  015112                                                                          .WORD   ERRG2
023226  000554                          BR      65$             ;EXIT ROUTINE
023230                          10$:
023230  005737  002352                  TST     INFLAG          ;ARE THE INPUTS DONE?
023234  001403                          BEQ     15$             ;BR IF NOT
023236  005737  002354                  TST     OUTFLG          ;ARE THE OUTPUTS DONE?
023242  001132                          BNE     60$             ;IF YES - ALL DONE, EXIT
023244                          15$:
023244  005737  002274                  TST     RESUME          ;IS A RESUME REQUESTED?
023250  001143                          BNE     65$             ;IF YES - OK, BR TO EXIT
023252                          16$:
023252                                  ERRDF   16,EMG16        ;ERROR - UNEXPECTED HALT.
023252  104455                                                                          TRAP    C$ERDF
023254  000020                                                                          .WORD   16
023256  020236                                                                          .WORD   EMG16
023260  000000                                                                          .WORD   0
023262  000137  023530                  JMP     60$
023266                          20$:
023266  005737  002302                  TST     MMANAG          ;ARE THE BUFFERS MEMORY MANAGED?
023272  001452                          BEQ     40$             ;IF NOT - NO NEED TO DETERMINE PHYS. ADDR.
023274  032777  040000  156736          BIT     #BIT14,@SEL6    ;IS BIT 16 OF THE PHYSICAL ADDR SET?
                                                                ;(I.E. BUFFER SHOULD BE IN PHYSICAL
                                                                ;ADDRESS RANGE: 200000 - 277776)
023302  001005                          BNE     21$             ;PROCEED - IF BIT SET.
023304                                  ERRDF   11,EMG11,ERRG2
023304  104455                                                                          TRAP    C$ERDF
023306  000013                                                                          .WORD   11
023310  020104                                                                          .WORD   EMG11
023312  015112                                                                          .WORD   ERRG2
023314  000505                          BR      60$
023316                          21$:
023316  042777  140000  156714          BIC     #BIT15!BIT14,@SEL6 ;CLEAR THE EXTENDED ADDRESS BITS.
023324  017702  156706                  MOV     @SEL4,R2        ;SAVE BITS 0-15 OF THE PHYSICAL ADDRESS.
023330  042702  017777                  BIC     #17777,R2       ;SAVE ONLY PAGE ADDRESS BITS.
023334  042777  160000  156674          BIC     #160000,@SEL4   ;CLEAR PAGE ADDRESS BITS IN SEL4
                                                                ;DETERMINE PAGE # FOR VIRTUAL ADDRESS.
023342  005702                          TST     R2              ;IS THIS PAGE 3?
023344  001004                          BNE     22$             ;IF NOT CHECK FOR OTHER PAGES
023346  052777  060000  156662          BIS     #60000,@SEL4    ;SET BITS FOR PAGE 3.
023354  000421                          BR      40$
023356                          22$:
023356  022702  020000                  CMP     #20000,R2       ;IS THIS PAGE 4?
023362  001004                          BNE     23$             ;IF NOT - KEEP CHECKING
023364  052777  100000  156644          BIS     #100000,@SEL4   ;SET BITS FOR PAGE 4.
```

```
023372  000412                          BR      40$
023374                          23$:
023374  022702  040000                  CMP     #40000,R2       ;IS THIS PAGE 5?
023400  001004                          BNE     24$             ;IF NOT - MUST BE PAGE 6
023402  052777  120000  156626          BIS     #120000,@SEL4   ;SET BITS FOR PAGE 5.
023410  000403                          BR      40$
023412                          24$:
023412  052777  140000  156616          BIS     #140000,@SEL4   ;SET BITS FOR PAGE 6.
023420                          40$:
023420  032777  000004  156606          BIT     #RCV,@SEL2      ;IS THIS A RECV. BUFFER?
023426  001023                          BNE     50$             ;IF YES - PROCESS THE BUFFER.
023430  005337  002334                  DEC     OUTXMT          ;DECREMENT BA/CC OUT XMIT.
023434  022577  156576                  CMP     (R5)+,@SEL4     ;IS THE XMIT BUFFER ADDRESS CORRECT?
023440  001406                          BEQ     41$             ;IF YES - PROCEED.
023442  005725                          TST     (R5)+           ;INCR. POINTER FOR ERROR MESSAGE.
023444                                  ERRDF   11,EMG11,ERRG8  ;IF NOT - ERROR
023444  104455                                                                          TRAP    C$ERDF
023446  000013                                                                          .WORD   11
023450  020104                                                                          .WORD   EMG11
023452  016050                                                                          .WORD   ERRG8
023454  000425                          BR      60$             ;EXIT ROUTINE
023456                          41$:
023456  022577  156556                  CMP     (R5)+,@SEL6     ;IS THE CHAR. COUNT CORRECT?
023462  001422                          BEQ     60$             ;IF OK - EXIT ROUTINE.
023464                                  ERRDF   12,EMG12,ERRG8  ;IF NOT - ERROR
023464  104455                                                                          TRAP    C$ERDF
023466  000014                                                                          .WORD   12
023470  020127                                                                          .WORD   EMG12
023472  016050                                                                          .WORD   ERRG8
023474  000415                          BR      60$             ;EXIT
023476                          50$:
023476  005337  002332                  DEC     OUTRCV          ;DECREMENT BA/CC OUT RCV
023502  022477  156530                  CMP     (R4)+,@SEL4     ;IS THE RCV BUFFER ADDRESS CORRECT?
023506  001406                          BEQ     51$             ;IF OK - PROCEED
023510                                  ERRDF   11,EMG11,ERRG7
023510  104455                                                                          TRAP    C$ERDF
023512  000013                                                                          .WORD   11
023514  020104                                                                          .WORD   EMG11
023516  015752                                                                          .WORD   ERRG7
023520  005724                          TST     (R4)+           ;UPDATE POINTER
023522  000402                          BR      60$             ;EXIT ROUTINE
023524                          51$:
023524  017724  156510                  MOV     @SEL6,(R4)+     ;CHANGE THE CHARACTER COUNT TO WHAT
                                                                ;WAS RECEIVED.
023530                          60$:
023530  005737  002334                  TST     OUTXMT          ;HAVE ALL THE XMITS BEEN DONE?
023534  001011                          BNE     65$             ;IF NOT, CONTINUE
023536  005737  002332                  TST     OUTRCV          ;HAVE ALL THE RECEIVES BEEN DONE?
023542  001006                          BNE     65$             ;IF NOT, CONTINUE
023544                          61$:
023544  042777  000100  156462          BIC     #IEO,@SEL2      ;CLEAR THE OUTPUT INTERRUPT
023552  012737  177777  002354          MOV     #-1,OUTFLG      ;FLAG AS DONE.
023560                          65$:
023560  042777  000207  156446          BIC     #RDO!CMD,@SEL2  ;CLEAR THE RDC BIT.
023566  012600                          MOV     (SP)+,R0        ;RESTORE R0
023570                          ENDSRV
023570                                                                          L10020:
```

```
        023570  000002                                                                    RTI
    363
    364                                 ;*****************************************************************
    365                                 ;*****************************************************************
    366
    367 023572                          BGNSRV  NOXMEM
        023572                                                                      NOXMEM::
    368
    369 023572  012737  000001  002350          MOV     #1,NXMFLG       ;SET FLAG IF MEMORY ADDRESSED IS NON-EXISTENT.
    370
    371 023600                          ENDSRV
        023600                                                                      L10021:
        023600  000002                                                                      RTI
    372
    373
```

```
                                .SBTTL  DROP UNIT SECTION

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

 023602                         BGNDU
 023602                                                                                 L$DU::

 023602                                 BRESET                  ;ISSUE UNIBUS RESET TO CLEAN UP
 023602  104433                                                                                 TRAP    C$RESET
 023604                                 PRINTF  #FMDROP,LOGDEV
 023604  013746  002366                                                                         MOV     LOGDEV,-(SP)
 023610  012746  023632                                                                         MOV     #FMDROP,-(SP)
 023614  012746  000002                                                                         MOV     #2,-(SP)
 023620  010600                                                                                 MOV     SP,R0
 023622  104417                                                                                 TRAP    C$PNTF
 023624  062706  000006                                                                         ADD     #6,SP

 023630                         ENDDU
 023630                                                                                 L10022:
 023630  104453                                                                                 TRAP    C$DU

 023632     045     116     045  FMDROP: .ASCIZ  /%N%AUNIT %D2%A DROPPED/
 023635     101     125     116
 023640     111     124     040
 023643     045     104     062
 023646     045     101     040
 023651     104     122     117
 023654     120     120     105
 023657     104     000
                                        .EVEN
```

```
                                .SBTTL          TEST 1 - DMR CSR VERIFICATION
                                ;
                                ;*****************************************************************
                                ;*              TEST 1 - DMR-11
                                ;* VERIFY THAT ADDRESSING THE 4 UNIBUS CSRS DOES NOT CAUSE A NON-
                                ;* EXISTENT MEMORY TRAP.
                                ;*
                                ;* THE DMR IS AN NPR DEVICE RESIDING ON A UNIBUS.  COMMUNICATION
                                ;* BETWEEN THE MAIN CPU AND THE DMR IS ACCOMPLISHED THROUGH A
                                ;* SET OF FOUR 16-BIT UNIBUS CONTROL AND STATUS REGISTERS (CSRS).
                                ;* THE FOUR REGISTERS ARE ASSIGNED ADDRESSES IN THE I/O PAGE
                                ;* FLOATING ADDRESS SPACE: 76XXX0 - 76XXX6
                                ;*
                                ;* NOTE: THIS TEST IS REDUNDANT IN THAT STATIC LOGIC TESTS SHOULD
                                ;* HAVE BEEN RUN BEFORE THESE FREE-RUNNING TESTS WERE STARTED, AND
                                ;* THEY SHOULD HAVE DETECTED ANY CSR ADDRESSING PROBLEMS.
                                ;* BUT JUST IN CASE THOSE STATIC TESTS AREN'T RUN, WE'LL BE SAFE.
                                ;*****************************************************************
 023662                         BGNTST
 023662                                                                                  T1::

 023662                                 SETVEC  #4,#LOCATE,#PRI07 ;SET UP NON -EXISTENT MEMORY TRAP VECTOR.
 023662  012746  000340                                                                  MOV     #PRI07,-(SP)
 023666  012746  024004                                                                  MOV     #LOCATE,-(SP)
 023672  012746  000004                                                                  MOV     #4,-(SP)
 023676  012746  000003                                                                  MOV     #3,-(SP)
 023702  104437                                                                          TRAP    C$SVEC
 023704  062706  000010                                                                  ADD     #10,SP
 023710  005037  002350                 CLR     NXMFLG          ;FLAG USED IN THE TRAP ROUTINE.
 023714  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
                                ;;*****************************************************************

 023716  005777  156310                 TST     @SEL0           ;TEST THE CSR AT 76XXX0
 023722  012701  000002                 MOV     #2,R1           ;SAVE THE OFFSET OF THE NEXT CSR
 023726  005777  156302                 TST     @SEL2           ;TEST THE CSR AT 76XXX2
 023732  012701  000004                 MOV     #4,R1           ;SAVE THE OFFSET OF THE NEXT CSR
 023736  005777  156274                 TST     @SEL4           ;TEST THE CSR AT 76XXX4
 023742  012701  000006                 MOV     #6,R1           ;SAVE THE OFFSET OF THE NEXT CSR
 023746  005777  156266                 TST     @SEL6           ;TEST THE CSR AT 76XXX6
 023752  005737  002350                 TST     NXMFLG          ;WAS THERE A TRAP?
 023756  001406                         BEQ     10$             ;IF NOT - EXIT.
 023760                                 DODU    LOGDEV          ;DROP THE DEVICE
 023760  013700  002366                                                                  MOV     LOGDEV,R0
 023764  104451                                                                          TRAP    C$DODU
 023766                                 DOCLN                   ,DO CLEAN UP - FORCE BACK TO INIT CODE.
 023766  104444                                                                          TRAP    C$DCLN
 023770  005037  002350                 CLR     NXMFLG          ;RESTORE THE FLAG.
 023774                         10$:
 023774                                 CLRVEC  #4              ;RETURN VECTOR 04 TO NORMAL STATE
 023774  012700  000004                                                                  MOV     #4,R0
 024000  104436                                                                          TRAP    C$CVEC
```

```
 46
 47 024002                          ENDTST
    024002                                                                  L10023:
    024002  104401                                                                  TRAP    C$ETST
 48
 49
 50 024004                          BGNSRV  LOCATE                  ;INTERRUPT SERVICE ROUTINE
    024004                                                                  LOCATE::
 51 024004  010046                          MOV     R0,-(SP)        ;SAVE R0
 52 024006  005737  002350                  TST     NXMFLG          ;HAVE WE HAD AT LEAST 1 PREVIOUS TRAP?
 53 024012  001006                          BNE     10$             ;IF YES, DON'T BOTHER DECLARING ANOTHER
 54                                                                 ;DEVICE FATAL ERROR
 55 024014                                  ERRDF   6,EMTO          ;NON-EXISTENT DEVICE ERROR
    024014  104455                                                                  TRAP    C$ERDF
    024016  000006                                                                  .WORD   6
    024020  024062                                                                  .WORD   EMTO
    024022  000000                                                                  .WORD   0
 56 024024  005237  002350                  INC     NXMFLG          ;SET THE FLAG
 57 024030                          10$:
 58 024030                                  PRINTX  #FMTO,R1,CSR(R1) ;PRINT THE CSR THAT DOESN'T RESPOND.
    024030  016146  002232                                                          MOV     CSR(R1),-(SP)
    024034  010146                                                                  MOV     R1,-(SP)
    024036  012746  024111                                                          MOV     #FMTO,-(SP)
    024042  012746  000003                                                          MOV     #3,-(SP)
    024046  010600                                                                  MOV     SP,R0
    024050  104415                                                                  TRAP    C$PNTX
    024052  062706  000010                                                          ADD     #10,SP
 59 024056  012600                          MOV     (SP)+,R0        ;RESTORE R0
 60 024060                          ENDSRV
    024060                                                                  L10024:
    024060  000002                                                                  RTI
 61
 62 024062     101     104     104  EMTO:   .ASCIZ  /ADDRESS ERROR - TRAP 4/
    024065     122     105     123
    024070     123     040     105
    024073     122     122     117
    024076     122     040     055
    024101     040     124     122
    024104     101     120     040
    024107     064     000
 63 024111     045     123     063  FMTO:   .ASCIZ  /%S3%ACSR (SEL%D1%A) AT %O6%A DOES NOT RESPOND%N/
    024114     045     101     103
    024117     123     122     040
    024122     050     123     105
    024125     114     045     104
    024130     061     045     101
    024133     051     040     101
    024136     124     040     045
    024141     117     066     045
    024144     101     040     104
    024147     117     105     123
    024152     040     116     117
    024155     124     040     122
    024160     105     123     120
    024163     117     116     104
    024166     045     116     000
 64                                         .EVEN
```

```
                                .SBTTL          TEST 2 - ROM CHECK

                                ;*****************************************************************
                                ;*              TEST 2 - DMR-11
                                ;* ROM CRC/CCITT - CHECK ROM POSITION AND CALCULATE CRC/CCITT.  THE
                                ;* LAST 4 BYTES CONTAIN INFORMATION ABOUT THE ROM TO CHECK.  THE 1ST
                                ;* OF THESE BYTES CONTAINS THE ASCII VERSION NUMBER.  THE 2ND BYTE
                                ;* CONTAINS THE ROM NUMBER.  THE 3RD AND 4TH BYTES CONTAIN A NEGATIVE
                                ;* CRC/CCITT WORD FOR THE ROM.
                                ;*                         CHIP ADDRESS RANGE
                                ;*    LOCATION  CHIP NO.        BYTE    ADDRESS RANGE
                                ;*      E03        0            LOW     0000 - 1777
                                ;*      E02        1            HIGH    0000 - 1777
                                ;*      E04        2            LOW     2000 - 3777
                                ;*      E01        3            HIGH    2000 - 3777
                                ;*      E05        4            LOW     4000 - 5777
                                ;*      E14        5            HIGH    4000 - 5777
                                ;*
                                ;*************** IMPORTANT !!!!!!!!!! ******************************
                                ;* FOR THIS TEST TO RUN CORRECTLY, ENSURE THAT SWITCH 1 AT LOCATION
                                ;* E85 ON THE M8207 IS ON.  IF THIS SWITCH IS OFF, BSEL1 WILL BE
                                ;* LOCKED OUT AND THE MAINTENANCE FEATURES WILL NOT BE ENABLED.
                                ;*****************************************************************
                                ;*
                                ;*      SUBTEST 1 - ON THE FIRST PASS PRINT THE VERSION # IN EACH ROM
                                ;*      SUBTEST 2 - GENERATE THE CRC-CCITT IN EACH ROM AND COMPARE IT
                                ;*                  IT AGAINST THE CRC BLASTED IN THE ROM
                                ;*      SUBTEST 3 - COMPARE THE ROM # BLASTED IN THE ROM AGAINST THE
                                ;*                  EXPECTED ROM #.
                                ;*
                                ;*****************************************************************
 024172                         BGNTST
 024172                                                                                  T2::
 024172                           BGNSUB
 024172                                                                                  T2.1:
 024172  104402                                                                                   TRAP    C$BSUB
 024174  022737  000001  002270          CMP     #1,STARES       ;IS THIS THE FIRST PASS?
 024202  001061                          BNE     5$              ;IF NOT - SKIP THIS SUBROUTINE.
                                                                 ;GET VERSION # FROM EACH ROM AND PRINT IT OUT
 024204  005004                          CLR     R4              ;# OF THE 1ST ROM
 024206  012705  000001                  MOV     #1,R5           ;# OF NEXT ROM
 024212  012737  001774  002410          MOV     #1774,ROMADR    ;ADDRESS OF BYTE CONTAINING # IN ROMS 0 & 1
 024220                                  PRINTB  #FMT1,LOGDEV    ;MICROCODE VERSION
 024220  013746  002366                                                                           MOV     LOGDEV,-(SP)
 024224  012746  025146                                                                           MOV     #FMT1,-(SP)
 024230  012746  000002                                                                           MOV     #2,-(SP)
 024234  010600                                                                                   MOV     SP,R0
 024236  104414                                                                                   TRAP    C$PNTB
 024240  062706  000006                                                                           ADD     #6,SP
 024244                         1$:
 024244                                  CALL    $ROMO           ;GET ROM CONTENTS.
 024250  117737  155764  025502          MOVB    @BSEL6,REV1     ;SAVE THE ASCII REVISION # OF THE ROM
 024256  117737  155766  025504          MOVB    @BSEL7,REV2     ;SAVE THE REV. # OF THE NEXT ROM
                                                                 ;PRINT
 024264                                  PRINTB  #FMT2,R4,#REV1,R5,#REV2
 024264  012746  025504                                                                           MOV     #REV2,-(SP)
 024270  010546                                                                                   MOV     R5,-(SP)
```

```
        024272  012746  025502                                                          MOV     #REV1,-(SP)
        024276  010446                                                                  MOV     R4,-(SP)
        024300  012746  025215                                                          MOV     #FMT2,-(SP)
        024304  012746  000005                                                          MOV     #5,-(SP)
        024310  010600                                                                  MOV     SP,R0
        024312  104414                                                                  TRAP    C$PNTB
        024314  062706  000014                                                          ADD     #14,SP
    47
    48  024320  022705  000005                  CMP     #5,R5           ;ARE WE DONE?
    49  024324  001410                          BEQ     5$              ;IF YES - EXIT
    50  024326  062704  000002                  ADD     #2,R4           ;INCR. ROM NUMBERS
    51  024332  062705  000002                  ADD     #2,R5           ;
    52  024336  062737  002000  002410          ADD     #2000,ROMADR    ;ADDRESS OF BYTES CONTAINING NEXT ROM REV #S.
    53  024344  000737                          BR      1$
    54
    55  024346                          5$:
    56  024346                            ENDSUB
        024346                                                                  L10026:
        024346  104403                                                                  TRAP    C$ESUB
    57
    58
    59  024350                            BGNSUB
        024350                                                                  T2.2:
        024350  104402                                                                  TRAP    C$BSUB
    60  024352  005037  002342                  CLR     FLAG            ;USE THE FLAG TO MARK WHEN AN ERRDF
    61                                                                  ;HAS BEEN DETECTED IN THIS TEST.
    62  024356  005004                          CLR     R4              ;START CRC CHECK WITH ROM 0
    63                                                                  ;R4 IS THE ROM #.  THE LOCATION FOR THE
    64                                                                  ;ROM IS CONTAINED IN THE TABLE 'ROMLOC'.
    65  024360  005037  002410                  CLR     ROMADR          ;BEGIN AT ROM ADDRESS 0
    66
    67  024364                          10$:
    68  024364  012737  177777  002400          MOV     #-1,LOCRC       ;INITIALIZE CRC WORD FOR THE LOW BYTE
    69                                                                  ;CALCULATION.
    70  024372  012737  177777  002402          MOV     #-1,HICRC       ;INIT. CRC WORD FOR THE HIGH BYTE.
    71  024400  012701  001000                  MOV     #1000,R1        ;COUNTER FOR LOOP TO READ THE ROM CONTENTS
    72                                                                  ;AND CALCULATE THE CRC - THE COUNTER IS 512.,
    73                                                                  ;BECAUSE 2 ADDRESS LOCATIONS ARE READ FOR EACH
    74                                                                  ;PASS (I.E. THE ROMS ARE 1K X 8 BITS)
    75
    76                                          ;
    77                                          ; BECAUSE A ROM OUT WILL OUTPUT THE ROM CONTENTS (I.E. 16 BITS)
    78                                          ; THIS ROUTINE WILL CALCULATE/CHECK THE CRC 2 ROMS AT A TIME.
    79                                          ;
    80  024404                          20$:
    81  024404                                  CALL    $ROMO           ;GET THE ROM CONTENTS
    82  024410  117737  155624  002404          MOVB    @BSEL6,LOWORD   ;SAVE THE LOW BYTE OF THE ROM CONTENTS.
    83  024416  117737  155626  002406          MOVB    @BSEL7,HIWORD   ;SAVE THE HIGH BYTE OF THE ROM CONTENTS.
    84  024424  005237  002410                  INC     ROMADR          ;INCREMENT THE ROM ADDRESS POINTER
    85  024430                                  CALL    $ROMO           ;GET THE CONTENTS OF THE NEXT ROM ADDRESS
    86  024434  117737  155600  002405          MOVB    @BSEL6,LOWORD+1 ;SAVE THE NEXT LOW BYTE.
    87  024442  117737  155602  002407          MOVB    @BSEL7,HIWORD+1 ;SAVE THE NEXT HIGH BYTE.
    88                                                                  ;NOTE: AT THIS POINT LOWORD IS A WORD WHICH
    89                                                                  ;HAS 2 CONSECUTIVE LOW BYTES OF ROM CONTENTS.
    90  024450  005237  002410                  INC     ROMADR          ;INCREMENT THE ROM ADDRESS POINTER
    91  024454  005301                          DEC     R1              ;ARE WE FINISHED WITH THESE 2 ROMS?
    92  024456  001443                          BEQ     40$             ;IF YES, CHECK CRC
```

```
                                                ;
                                                ; CRC/CCITT CALCULATION - CONVERT THE WORD (LOWORD & HIWORD) TO
                                                ;                         A SERIAL STREAM FOR CALCULATION.
                                                ;
024460  012703  000020                          MOV     #16.,R3         ;16 BITS TO CONSIDER
024464                          25$:
024464  000241                                  CLC                     ;CLEAR THE CARRY
024466  006037  002400                          ROR     LOCRC           ;ROTATE BIT0 INTO THE CARRY BIT
024472  006037  002404                          ROR     LOWORD          ;ROTATE BIT0 INTO C AND THE OLD C INTO BIT15
                                                                        ;ARE THE BITS 15 & BITS 0 THE SAME?
                                                                        ;IF YES (V IS CLEAR), DON'T DO THE CRC
024476  102011                                  BVC     30$             ;NOTE: V IS THE EXCLUSIVE OR OF BIT0 & BIT15.
024500  012702  102010                          MOV     #102010,R2      ;CRC/CCITT POLYNOMIAL
024504  043702  002400                          BIC     LOCRC,R2
024510  042737  102010  002400                  BIC     #102010,LOCRC
024516  050237  002400                          BIS     R2,LOCRC
024522                          30$:
024522  000241                                  CLC                     ;CLEAR THE CARRY
024524  006037  002402                          ROR     HICRC           ;ROTATE BIT 0 INTO C
024530  006037  002406                          ROR     HIWORD          ;ROTATE OLD C INTO BIT15 (SIGN) & BIT0 INTO C
                                                                        ;ARE THE BITS 0 OF HICRC & HIWORD THE SAME?
024534  102011                                  BVC     35$             ;IF YES (V IS CLEAR), DON'T DO THE CRC.
                                                                        ;NOTE: V IS THE EXCLUSIVE OR OF BIT0 & BIT15.
024536  012702  102010                          MOV     #102010,R2      ;CRC/CCITT POLYNOMIAL
024542  043702  002402                          BIC     HICRC,R2
024546  042737  102010  002402                  BIC     #102010,HICRC
024554  050237  002402                          BIS     R2,HICRC
024560                          35$:
024560  005303                                  DEC     R3              ;DO ALL 16 BITS
024562  001340                                  BNE     25$
024564  000707                                  BR      20$             ;GET THE CONTENTS OF THE NEXT 2 ROM ADDRESSES.
024566                          40$:
                                                ;
                                                ; AT THIS POINT WE'VE READ THE CONTENTS AND CALCULATED THE CRC FOR
                                                ; 2 ROM ROMS (ONE LOW BYTE & ONE HIGH BYTE).  ALSO WE'VE READ THE
                                                ; CRC BLASTED INTO THE LAST 2 BYTES OF THE ROM (IN LOWORD/HIWORD)
                                                ;
024566  005137  002400                          COM     LOCRC           ;COMPLEMENT THE CALCULATED CRC .
024572  023737  002400  002404                  CMP     LOCRC,LOWORD    ;IS THE CRC IN ROM THE SAME AS THE
                                                                        ;CALCULATED CRC?
024600  001427                                  BEQ     50$             ;IF YES - CHECK THE HIGH BYTE CRC (NEXT ROM)
024602  005737  002342                          TST     FLAG            ;HAS AN ERRDF ALREADY BEEN DECLARED (REMEMBER
                                                                        ;WE'RE IN A LOOP)
024606  001007                                  BNE     41$             ;IF YES, DON'T BOTHER WITH ANOTHER ERRDF.
024610  012737  000001  002342                  MOV     #1,FLAG         ;FLAG THAT ERRDF HAS BEEN DETECTED.
024616                                          ERRDF   7,EMT1          ;ROM ERROR
024616  104455                                                                          TRAP    C$ERDF
024620  000007                                                                          .WORD   7
024622  025434                                                                          .WORD   EMT1
024624  000000                                                                          .WORD   0
024626                          41$:
024626                                          PRINTB  #FMT3,R4,LOCRC,LOWORD
024626  013746  002404                                                                  MOV     LOWORD,-(SP)
024632  013746  002400                                                                  MOV     LOCRC,-(SP)
024636  010446                                                                          MOV     R4,-(SP)
024640  012746  025272                                                                  MOV     #FMT3,-(SP)
024644  012746  000004                                                                  MOV     #4,-(SP)
```

```
        024650  010600                                                                          MOV     SP,R0
        024652  104414                                                                          TRAP    C$PNTB
        024654  062706  000012                                                                  ADD     #12,SP
    141 024660                          50$:
    142 024660  005204                          INC     R4              ;INCR ROM #
    143 024662  005137  002402                  COM     HICRC           ;COMPLEMENT THE CALCULATED CRC FOR THE HI BYTE
    144 024666  023737  002402  002406          CMP     HICRC,HIWORD    ;ROM CRC AND CALCULATED CRC THE SAME?
    145 024674  001427                          BEQ     60$             ;IF YES - CHECK THE ROM LOCATIONS.
    146 024676  005737  002342                  TST     FLAG            ;HAS AN ERRDF ALREADY BEEN DECLARED (REMEMBER
    147                                                                 ;WE'RE IN A LOOP)
    148 024702  001007                          BNE     51$             ;IF YES, DON'T BOTHER WITH ANOTHER ERRDF.
    149 024704  012737  000001  002342          MOV     #1,FLAG         ;FLAG THAT ERRDF HAS BEEN DETECTED.
    150 024712                                  ERRDF   7,EMT1          ;ROM ERROR
        024712  104455                                                                          TRAP    C$ERDF
        024714  000007                                                                          .WORD   7
        024716  025434                                                                          .WORD   EMT1
        024720  000000                                                                          .WORD   0
    151 024722                          51$:
    152 024722                                  PRINTB  #FMT3,R4,HICRC,HIWORD
        024722  013746  002406                                                                  MOV     HIWORD,-(SP)
        024726  013746  002402                                                                  MOV     HICRC,-(SP)
        024732  010446                                                                          MOV     R4,-(SP)
        024734  012746  025272                                                                  MOV     #FMT3,-(SP)
        024740  012746  000004                                                                  MOV     #4,-(SP)
        024744  010600                                                                          MOV     SP,R0
        024746  104414                                                                          TRAP    C$PNTB
        024750  062706  000012                                                                  ADD     #12,SP
    153 024754                          60$:
    154 024754  022704  000005                  CMP     #5,R4           ;IF WE'VE DONE ROMS 0-5, WE'RE DONE.
    155 024760  001403                          BEQ     70$             ;EXIT WHEN DONE
    156 024762  005204                          INC     R4              ;CHECK THE NEXT ROM.
    157 024764  000137  024364                  JMP     10$
    158 024770                          70$:
    159
    160 024770                          ENDSUB
        024770                                                                          L10027:
        024770  104403                                                                          TRAP    C$ESUB
    161
    162 024772                          BGNSUB
        024772                                                                          T2.3:
        024772  104402                                                                          TRAP    C$BSUB
    163 024774  005037  002342                  CLR     FLAG            ;CLEAR FLAG
    164 025000  005004                          CLR     R4              ;BEGIN AT ROM 0
    165 025002  012737  001775  002410          MOV     #1775,ROMADR    ;ADDRESS OF BYTE CONTAINING ROM #
    166 025010                          10$:
    167 025010                                  CALL    $ROMO           ;GET ROM CONTENTS
    168 025014  117701  155220                  MOVB    @BSEL6,R1       ;SAVE THE CONTENTS OF THE LOW BYTE
    169                                                                 ;FOR ROMS 0,2,4
    170 025020  000402                          BR      17$
    171 025022                          15$:
    172 025022  117701  155222                  MOVB    @BSEL7,R1       ;SAVE THE CONTENTS OF THE HIGH BYTE
    173                                                                 ;FOR ROMS 1,3,5
    174 025026                          17$:
    175 025026  042701  177760                  BIC     #^C17,R1        ;CONVERT THE ASCII BYTE TO AN OCTAL WORD.
    176 025032  020104                          CMP     R1,R4           ;IS THIS THE EXPECTED ROM #
    177 025034  001427                          BEQ     20$             ;IF YES - OK.
    178 025036  005737  002342                  TST     FLAG            ;HAS AN ERRDF ALREADY BEEN DECLARED (REMEMBER
```

```
                                                                        ;WE'RE IN A LOOP)
025042  001007                          BNE     18$                     ;IF YES, DON'T BOTHER WITH ANOTHER ERRDF.
025044  012737  000001  002342          MOV     #1,FLAG                 ;FLAG THAT ERRDF HAS BEEN DETECTED.
025052                                  ERRDF   7,EMT2                  ;ROM ERROR
025052  104455                                                                                          TRAP    C$ERDF
025054  000007                                                                                          .WORD   7
025056  025454                                                                                          .WORD   EMT2
025060  000000                                                                                          .WORD   0
025062                          18$:
025062                                  PRINTB  #FMT4,<B,ROMLOC(R4)>,R1,R4
025062  010446                                                                                          MOV     R4,-(SP)
025064  010146                                                                                          MOV     R1,-(SP)
025066  005046                                                                                          CLR     -(SP)
025070  156416  025473                                                                                  BISB    ROMLOC(R4),(SP)
025074  012746  025356                                                                                  MOV     #FMT4,-(SP)
025100  012746  000004                                                                                  MOV     #4,-(SP)
025104  010600                                                                                          MOV     SP,R0
025106  104414                                                                                          TRAP    C$PNTB
025110  062706  000012                                                                                  ADD     #12,SP
025114                          20$:
025114  022704  000005                  CMP     #5,R4                   ;DID WE FINISH THE LAST ROM?
025120  001410                          BEQ     30$                     ;IF YES - SKIP TO THE END
025122  005204                          INC     R4                      ;POINT TO THE NEXT ROM #
025124  032704  000001                  BIT     #BIT0,R4                ;IS THIS AN ODD #
025130  001334                          BNE     15$                     ;IF YES GO BACK AND READ THE HIGH BYTE

025132  062737  002000  002410          ADD     #2000,ROMADR            ;INCR. ADDRESS POINTER TO NEXT ROM #.
025140  000723                          BR      10$
025142                          30$:
025142                            ENDSUB
025142                                                                                          L10030:
025142  104403                                                                                          TRAP    C$ESUB

025144                          ENDTST
025144                                                                                          L10025:
025144  104401                                                                                          TRAP    C$ETST
025146     045     116     045  FMT1:   .ASCIZ  /%N%AMICROCODE REVISION IN UNIT%D3%A:%N/
025151     101     115     111
025154     103     122     117
025157     103     117     104
025162     105     040     122
025165     105     126     111
025170     123     111     117
025173     116     040     111
025176     116     040     125
025201     116     111     124
025204     045     104     063
025207     045     101     072
025212     045     116     000
025215     045     101     122  FMT2:   .ASCIZ  /%AROM%D2%A - REV. %T%N%AROM%D2%A - REV. %T%N/
025220     117     115     045
025223     104     062     045
025226     101     040     055
025231     040     122     105
025234     126     056     040
025237     045     124     045
025242     116     045     101
```

```
        025245    122    117    115
        025250    045    104    062
        025253    045    101    040
        025256    055    040    122
        025261    105    126    056
        025264    040    045    124
        025267    045    116    000
    200 025272    045    101    122  FMT3:   .ASCIZ  /%AROM%D2%A: CALCUATED CRC =%O6%A  CRC IN ROM =%O6%N/
        025275    117    115    045
        025300    104    062    045
        025303    101    072    040
        025306    103    101    114
        025311    103    125    101
        025314    124    105    104
        025317    040    103    122
        025322    103    040    075
        025325    045    117    066
        025330    045    101    040
        025333    040    103    122
        025336    103    040    111
        025341    116    040    122
        025344    117    115    040
        025347    075    045    117
        025352    066    045    116
        025355    000
    201 025356    045    101    105  FMT4:   .ASCIZ  /%AE%D2%A IS ROM %D1%A (SHOULD BE ROM %D1%A)%N/
        025361    045    104    062
        025364    045    101    040
        025367    111    123    040
        025372    122    117    115
        025375    040    045    104
        025400    061    045    101
        025403    040    050    123
        025406    110    117    125
        025411    114    104    040
        025414    102    105    040
        025417    122    117    115
        025422    040    045    104
        025425    061    045    101
        025430    051    045    116
        025433    000
    202
    203 025434    103    122    103  EMT1:   .ASCIZ  /CRC-CCITT ERROR/
        025437    055    103    103
        025442    111    124    124
        025445    040    105    122
        025450    122    117    122
        025453    000
    204 025454    114    117    103  EMT2:   .ASCIZ  /LOCATION ERROR/
        025457    101    124    111
        025462    117    116    040
        025465    105    122    122
        025470    117    122    000
    205
    206 025473    003    002    004  ROMLOC: .BYTE 3,2,4,1,5,14.     ;ROM 0 - ROM LOCATION 3 ETC.
        025476    001    005    016
    207                                        .EVEN
```

```
208 025502  000000                  REV1:   .WORD   0               ;ASCII VALUE OF THE REV. NUMBER
209 025504  000000                  REV2:   .WORD   0               ;ASCII VALUE OF THE REV. NUMBER
210
211
212
```

```
                                .SBTTL          TEST 3 - MASTER CLEAR AND MICROTEST

                                ;*******************************************************************
                                ;*              TEST 3 - DMR-11
                                ;* MASTER CLEAR
                                ;* THIS TEST WILL ISSUE 2 MASTER CLEARS.  EACH CALL TO THE MASTER
                                ;* CLEAR ROUTINE WILL ENSURE THAT THE RUN BIT WILL BE SET.  ALSO
                                ;* THE MASTER CLEAR WILL CAUSE THE DIAGNOSTIC MICROTESTS TO BE
                                ;* RUN WHEN THE MICRODIAGNOSTIC BIT (BIT 13 IN SEL0) IS CORRECTLY
                                ;* SET OR CLEARED.  BECAUSE THE RUNNING OF MICROTESTS DEPENDS ON THE
                                ;* EXCLUSIVE OR OF THE  HARDWARE SWITCH 10 ON E134 OF THE M8203 AND
                                ;* THE MICRODIAGNOSTIC BIT, WE CAN'T KNOW WHETHER THE SETTING OR
                                ;* CLEARING OF BIT 13 WILL RESULT IN THE RUNNING OF MICROTESTS.
                                ;* THEREFORE THE MASTER CLEAR SUBROUTINE WILL TOGGLE (I.E. SET
                                ;* BIT 13 ONLY ON EVERY OTHER MASTER CLEAR) THE SOFTWARE BIT.
                                ;* THIS WILL ENSURE THAT REGARDLESS OF THE POSITION OF THE
                                ;* HARDWARE SWITCH, MICROTESTS WILL BE RUN EVERY OTHER MASTER CLEAR.
                                ;* WHEN RUNNING THIS TEST, WE EXPECT TO ADD THE RESULTS OF BSEL3
                                ;* AFTER EACH MASTER CLEAR.
                                ;* BSEL3 = 100          -  MICROTESTS DISABLED
                                ;* BSEL3 = 200          -  MICROTESTS RUN SUCCESFULLY
                                ;* IF THE RESULT OF THE 2 MASTER CLEARS IS NOT 300, AN ERROR IS
                                ;* REPORTED.
                                ;*
                                ;* ADDITIONALLY THIS ROUTINE WILL REPORT WHENEVER THE RESULT OF
                                ;* BSEL3 IS 0.  THIS WILL MEAN THAT THE DEVICE IS NOT A DMR
                                ;* (I.E. DMC)
                                ;*******************************************************************
 025506                         BGNTST
 025506                                                                                  T3::
 025506                                 CLEAR                   ;MACRO FOR MASTER CLEAR
                                                                ;**** MACRO EXPANSION ****
 025506  004737  011066                 JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                                ;****                   ****

 025512                                 ESCAPE  TST             ;IF ERROR, BR TO TEST END.
 025512  104410                                                                          TRAP    C$ESCAPE
 025514  000072                                                                          .WORD   L10031-.
 025516  105777  154522                 TSTB    @BSEL3          ;IS THERE A DMR RESPONSE?
 025522  001011                         BNE     1$
 025524                                 PRINTB  #FMG19          ;REPORT DEVICE NOT DMR.
 025524  012746  017424                                                                  MOV     #FMG19,-(SP)
 025530  012746  000001                                                                  MOV     #1,-(SP)
 025534  010600                                                                          MOV     SP,R0
 025536  104414                                                                          TRAP    C$PNTB
 025540  062706  000004                                                                  ADD     #4,SP
 025544  000420                         BR      5$
 025546                         1$:
 025546  117701  154472                 MOVB    @BSEL3,R1       ;SAVE THE RESULT OF THE FIRST MASTER CLEAR.
 025552                                 CLEAR                   ;MASTER CLEAR AGAIN.
                                                                ;**** MACRO EXPANSION ****
 025552  004737  011066                 JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                                ;****                   ****

 025556                                 ESCAPE  TST             ;IF ERROR, BR TO TEST END.
 025556  104410                                                                          TRAP    C$ESCAPE
 025560  000026                                                                          .WORD   L10031-.
```

```
 42 025562  117702  154456                MOVB    @BSEL3,R2       ;SAVE THE RESULTS OF THE SECOND MASTER CLEAR
 43 025566  060102                        ADD     R1,R2           ;ADD THE RESULTS OF THE 2 CLEARS
 44                                                               ;NOTE: ONE SHOULD BE 100 - MICRO TESTS NOT
 45                                                               ;ENABLED AND ONE SHOULD BE 200 - MICRO TESTS
 46                                                               ;SUCCESFULLY RUN.
 47 025570  122702  000300                CMPB    #300,R2         ;WAS THE MICROTEST COMPLETED?
 48 025574  001404                        BEQ     5$              ;IF YES - OK
 49 025576                                ERRDF   3,EMT3,ERRG3    ;MICROTEST NOT COMPLETED
    025576  104455                                                                          TRAP    C$ERDF
    025600  000003                                                                          .WORD   3
    025602  025610                                                                          .WORD   EMT3
    025604  015226                                                                          .WORD   ERRG3
 50 025606                        5$:
 51 025606                        ENDTST
    025606                                                                       L10031:
    025606  104401                                                                          TRAP    C$ETST
 52
 53 025610     115     111     103  EMT3:   .ASCIZ  /MICROTEST NOT COMPLETED/
    025613     122     117     124
    025616     105     123     124
    025621     040     116     117
    025624     124     040     103
    025627     117     115     120
    025632     114     105     124
    025635     105     104     000
 54                                       .EVEN
```

```
                                .SBTTL          TEST 4 - BASE IN COMMAND

                                ;*******************************************************************
                                ;*              TEST 4 - DMR-11
                                ;*  BASE IN COMMANDS
                                ;*
                                ;*  SUBTEST 1  - ISSUE A BASE IN  -  DMR MODE.
                                ;*               ENSURE THAT THE DMR MODE BIT (BIT 4) IS SET IN
                                ;*               THE MICROCODE SCRATCH PAD 7 AND THAT THE DDCMP
                                ;*               MESSAGE VARIABLES ARE PROPERLY INITIALIZED.
                                ;*  SUBTEST 2  - ISSUE A BASE IN  -  DMC MODE.
                                ;*               ENSURE THAT THE DMC MODE BIT (BIT 4) IS CLEAR IN
                                ;*               THE MICROCODE SCRATCH PAD 7 AND THAT THE DDCMP
                                ;*               MESSAGE VARIABLES ARE PROPERLY INITIALIZED.
                                ;*
                                ;*******************************************************************
 025640                         BGNTST
 025640                                                                                  T4::
 025640                            BGNSUB
 025640                                                                                  T4.1:
 025640  104402                                                                                  TRAP    C$BSUB
 025642                                 CLEAR                    ;MACRO FOR MASTER CLEAR COMMAND
                                                                 ;**** MACRO EXPANSION ****
 025642  004737  011066                 JSR     PC, $MSCLR       ;ISSUE A DMR MASTER CLEAR
                                                                 ;****                   ****

 025646                                 ESCAPE  TST              ;IF ERROR, BR TO TEST END
 025646  104410                                                                                  TRAP    C$ESCAPE
 025650  000244                                                                                  .WORD   L10032-.

                                                                 ;BASE IN COMMAND WITH NO MAINTENANCE,
 025652                                 BASEIN  0,BASE,DMR       ;BASE=BASE TABLE ADDRESS, AND DMR-11 MODE
                                                                 ;**** MACRO EXPANSION ****
 025652  004737  011264                 JSR     PC, $BASEI       ;CALL BASE IN ROUTINE
 025656  000000                                 .WORD   0        ;MAINTENANCE MODE BITS TO SET IN BSEL1
 025660  002636                                 .WORD   BASE     ;BASE TABLE ADDRESS
 025662  000522                                 .WORD   DMR      ;MODE
                                                                 ;****                   ****

 025664                                 ESCAPE  TST              ;IF ERROR, BR TO TEST END
 025664  104410                                                                                  TRAP    C$ESCAPE
 025666  000226                                                                                  .WORD   L10032-.
 025670                                 SHUTDN
                                                                 ;**** MACRO EXPANSION ****
 025670  004737  012550                 JSR     PC, $HALT        ;DMR HALT ROUTINE.
                                                                 ;****                   ****
 025674  132737  000020  002730         BITB    #BIT4,BASE+ISP7  ;SEE IF THE DMR MODE BIT IS SET IN THE
                                                                 ;DMR SCRATCH PAD REGISTER 7 (BASE TABLE
                                                                 ;LOCATION CONTAINS AN IMAGE OF SP7)
 025702  001004                         BNE     10$              ;OK IF SET - BR
 025704                                 ERRDF   20,EMT4
 025704  104455                                                                                  TRAP    C$ERDF
 025706  000024                                                                                  .WORD   20
 025710  026336                                                                                  .WORD   EMT4
 025712  000000                                                                                  .WORD   0
 025714                         10$:
                                                                 ;CHECK MESSAGE EXCHANGE VALUES
                                                                 ;IN THE BASE TABLE.
```

```
 35 025714  105737  002700                 TSTB    BASE+R          ; #R (MESSAGE RECEIVED) = 0?
 36 025720  001015                         BNE     20$             ;ERROR IF NON ZERO
 37 025722  105737  002701                 TSTB    BASE+N          ; #N (MESSAGE TRANSMITTED) = 0?
 38 025726  001012                         BNE     20$             ;ERROR IF NON ZERO
 39 025730  105737  002702                 TSTB    BASE+A          ; #A (MESSAGE ACKNOWLEDGED) = 0?
 40 025734  001007                         BNE     20$             ;ERROR IF NON ZERO
 41 025736  122737  000001  002703         CMPB    #1,BASE+T       ; #T (NEXT MESSAGE # TRANSMITTED) = 1?
 42 025744  001003                         BNE     20$             ;ERROR IF NOT EQUAL TO 1.
 43 025746  105737  002704                 TSTB    BASE+X          ; #X (LAST MESSAGE TRANSMITTED) = 0?
 44 025752  001404                         BEQ     30$
 45 025754                          20$:
 46 025754                                 ERRDF   20,EMT5,ERRT1
    025754  104455                                                                    TRAP    C$ERDF
    025756  000024                                                                    .WORD   20
    025760  026363                                                                    .WORD   EMT5
    025762  026116                                                                    .WORD   ERRT1
 47 025764                          30$:
 48 025764                             ENDSUB
    025764                                                                      L10033:
    025764  104403                                                                    TRAP    C$ESUB
 49
 50 025766                             BGNSUB
    025766                                                                      T4.2:
    025766  104402                                                                    TRAP    C$BSUB
 51 025770                                 CLEAR                   ;MACRO FOR MASTER CLEAR COMMAND
                                                                   ;**** MACRO EXPANSION ****
    025770  004737  011066                 JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                                   ;****                 ****
 52
 53 025774                                 ESCAPE  TST             ;IF ERROR, BR TO TEST END
    025774  104410                                                                    TRAP    C$ESCAPE
    025776  000116                                                                    .WORD   L10032-.
 54
 55                                                                ;BASE IN COMMAND WITH NO MAINTENANCE
 56 026000                                 BASEIN  0,BASE,0        ;AND DMC MODE.
                                                                   ;**** MACRO EXPANSION ****
    026000  004737  011264                 JSR     PC, $BASEI      ;CALL BASE IN ROUTINE
    026004  000000                                 .WORD   0       ;MAINTENANCE MODE BITS TO SET IN BSEL1
    026006  002636                                 .WORD   BASE    ;BASE TABLE ADDRESS
    026010  000000                                 .WORD   0       ;MODE
                                                                   ;****                 ****
 57
 58 026012                                 ESCAPE  TST             ;IF ERROR, BR TO TEST END
    026012  104410                                                                    TRAP    C$ESCAPE
    026014  000100                                                                    .WORD   L10032-.
 59 026016                                 SHUTDN
                                                                   ;**** MACRO EXPANSION ****
    026016  004737  012550                 JSR     PC, $HALT       ;DMR HALT ROUTINE.
                                                                   ;****                 ****
 60 026022  132737  000020  002730         BITB    #BIT4,BASE+ISP7 ;SEE IF THE DMR MODE BIT IS CLEAR IN THE
 61                                                                ;DMR SCRATCH PAD REGISTER 7 (BASETABLE
 62                                                                ;LOCATION CONTAINS AN IMAGE OF SP7)
 63 026030  001404                         BEQ     10$             ;OK IF CLEAR - BR
 64 026032                                 ERRDF   20,EMT6
    026032  104455                                                                    TRAP    C$ERDF
    026034  000024                                                                    .WORD   20
    026036  026431                                                                    .WORD   EMT6
```

```
     026040  000000                                                                                    .WORD   0
  65 026042                          10$:
  66                                                                  ;CHECK MESSAGE EXCHANGE VALUES
  67                                                                  ;IN THE BASE TABLE.
  68 026042  105737  002700                TSTB    BASE+R             ; #R (MESSAGE RECEIVED) = 0?
  69 026046  001015                        BNE     20$                ;ERROR IF NON ZERO
  70 026050  105737  002701                TSTB    BASE+N             ; #N (MESSAGE TRANSMITTED) = 0?
  71 026054  001012                        BNE     20$                ;ERROR IF NON ZERO
  72 026056  105737  002702                TSTB    BASE+A             ; #A (MESSAGE ACKNOWLEDGED) = 0?
  73 026062  001007                        BNE     20$                ;ERROR IF NON ZERO
  74 026064  122737  000001  002703        CMPB    #1,BASE+T          ; #T (NEXT MESSAGE # TRANSMITTED) = 1?
  75 026072  001003                        BNE     20$                ;ERROR IF NOT EQUAL TO 1.
  76 026074  105737  002704                TSTB    BASE+X             ; #X (LAST MESSAGE TRANSMITTED) = 0?
  77 026100  001404                        BEQ     30$
  78 026102                          20$:
  79 026102                                ERRDF   20,EMT5,ERRT1
     026102  104455                                                                                    TRAP    C$ERDF
     026104  000024                                                                                    .WORD   20
     026106  026363                                                                                    .WORD   EMT5
     026110  026116                                                                                    .WORD   ERRT1
  80 026112                          30$:
  81 026112                             ENDSUB
     026112                                                                                L10034:
     026112  104403                                                                                    TRAP    C$ESUB
  82
  83 026114                          ENDTST
     026114                                                                                L10032:
     026114  104401                                                                                    TRAP    C$ETST
  84
  85 026116                          BGNMSG  ERRT1
     026116                                                                                ERRT1::
  86 026116  105737  002700                TSTB    BASE+R             ;IS #R = 0?
  87 026122  001413                        BEQ     1$                 ;OK - IF ZERO
  88 026124                                PRINTB  #FMT5,<B,BASE+R>   ;PRINT #R
     026124  005046                                                                                    CLR     -(SP)
     026126  153716  002700                                                                            BISB    BASE+R,(SP)
     026132  012746  026470                                                                            MOV     #FMT5,-(SP)
     026136  012746  000002                                                                            MOV     #2,-(SP)
     026142  010600                                                                                    MOV     SP,R0
     026144  104414                                                                                    TRAP    C$PNTB
     026146  062706  000006                                                                            ADD     #6,SP
  89 026152                          1$:
  90 026152  105737  002701                TSTB    BASE+N             ;IS #N = 0?
  91 026156  001413                        BEQ     2$                 ;OK - IF ZERO
  92 026160                                PRINTB  #FMT6,<B,BASE+N>   ;PRINT #N
     026160  005046                                                                                    CLR     -(SP)
     026162  153716  002640                                                                            BISB    BASE+2,(SP)
     026166  012746  026521                                                                            MOV     #FMT6,-(SP)
     026172  012746  000002                                                                            MOV     #2,-(SP)
     026176  010600                                                                                    MOV     SP,R0
     026200  104414                                                                                    TRAP    C$PNTB
     026202  062706  000006                                                                            ADD     #6,SP
  93 026206                          2$.
  94
  95 026206  105737  002702                TSTB    BASE+A             ;IS #A = 0?
  96 026212  001413                        BEQ     3$                 ;OK - IF ZERO
  97 026214                                PRINTB  #FMT7,<B,BASE+A>   ;PRINT #A
```

```
        026214  005046                                                                          CLR     -(SP)
        026216  153716  002702                                                                  BISB    BASE+A,(SP)
        026222  012746  026552                                                                  MOV     #FMT7,-(SP)
        026226  012746  000002                                                                  MOV     #2,-(SP)
        026232  010600                                                                          MOV     SP,R0
        026234  104414                                                                          TRAP    C$PNTB
        026236  062706  000006                                                                  ADD     #6,SP
     98 026242                          3$:
     99 026242  122737  000001  002703          CMPB    #1,BASE+T         ;IS #T = 1?
    100 026250  001413                          BEQ     4$                ;OK - IF ONE
    101 026252                                  PRINTB  #FMT8,<B,BASE+T>  ;PRINT #T
        026252  005046                                                                          CLR     -(SP)
        026254  153716  002703                                                                  BISB    BASE+T,(SP)
        026260  012746  026603                                                                  MOV     #FMT8,-(SP)
        026264  012746  000002                                                                  MOV     #2,-(SP)
        026270  010600                                                                          MOV     SP,R0
        026272  104414                                                                          TRAP    C$PNTB
        026274  062706  000006                                                                  ADD     #6,SP
    102 026300                          4$:
    103 026300  105737  002704                  TSTB    BASE+X            ;IS #X = 0?
    104 026304  001413                          BEQ     5$                ;OK - IF ZERO
    105 026306                                  PRINTB  #FMT9,<B,BASE+X>  ;PRINT #X
        026306  005046                                                                          CLR     -(SP)
        026310  153716  002704                                                                  BISB    BASE+X,(SP)
        026314  012746  026634                                                                  MOV     #FMT9,-(SP)
        026320  012746  000002                                                                  MOV     #2,-(SP)
        026324  010600                                                                          MOV     SP,R0
        026326  104414                                                                          TRAP    C$PNTB
        026330  062706  000006                                                                  ADD     #6,SP
    106 026334                          5$:
    107 026334                          ENDMSG
        026334                                                                          L10035:
        026334  104423                                                                          TRAP    C$MSG
    108
    109 026336     104     115     122  EMT4:    .ASCIZ  /DMR MODE BIT NOT SET/
        026341     040     115     117
        026344     104     105     040
        026347     102     111     124
        026352     040     116     117
        026355     124     040     123
        026360     105     124     000
    110 026363     104     104     103  EMT5:    .ASCIZ  /DDCMP MESSAGE VARIABLE(S) NOT CORRECT/
        026366     115     120     040
        026371     115     105     123
        026374     123     101     107
        026377     105     040     126
        026402     101     122     111
        026405     101     102     114
        026410     105     050     123
        026413     051     040     116
        026416     117     124     040
        026421     103     117     122
        026424     122     105     103
        026427     124     000
    111 026431     104     115     103  EMT6:    .ASCIZ  /DMC MODE - DMR BIT NOT CLEARED/
        026434     040     115     117
        026437     104     105     040
```

```
        026442    055    040    104
        026445    115    122    040
        026450    102    111    124
        026453    040    116    117
        026456    124    040    103
        026461    114    105    101
        026464    122    105    104
        026467    000
    112
    113 026470    045    101    043  FMT5:   .ASCIZ  /%A#R (MSG. RCVD) = %D3%N/
        026473    122    040    050
        026476    115    123    107
        026501    056    040    122
        026504    103    126    104
        026507    051    040    075
        026512    040    045    104
        026515    063    045    116
        026520    000
    114 026521    045    101    043  FMT6:   .ASCIZ  /%A#N (MSG. XMIT) = %D3%N/
        026524    116    040    050
        026527    115    123    107
        026532    056    040    130
        026535    115    111    124
        026540    051    040    075
        026543    040    045    104
        026546    063    045    116
        026551    000
    115 026552    045    101    043  FMT7:   .ASCIZ  /%A#A (MSG. ACK)  = %D3%N/
        026555    101    040    050
        026560    115    123    107
        026563    056    040    101
        026566    103    113    051
        026571    040    040    075
        026574    040    045    104
        026577    063    045    116
        026602    000
    116 026603    045    101    043  FMT8:   .ASCIZ  /%A#T (NEXT XMIT) = %D3%N/
        026606    124    040    050
        026611    116    105    130
        026614    124    040    130
        026617    115    111    124
        026622    051    040    075
        026625    040    045    104
        026630    063    045    116
        026633    000
    117 026634    045    101    043  FMT9:   .ASCIZ  /%A#X (LAST XMIT) = %D3%N/
        026637    130    040    050
        026642    114    101    123
        026645    124    040    130
        026650    115    111    124
        026653    051    040    075
        026656    040    045    104
        026661    063    045    116
        026664    000
    118                                     .EVEN
```

```
                                .SBTTL          TEST 5 - DMR COMMANDS

                                ;*******************************************************************
                                ;*              TEST 5 - DMR-11
                                ;* DMR COMMANDS
                                ;*  SUBTEST 1  - ISSUE AN ENABLE EXTENDED ERROR COMMAND AND CHECK THAT
                                ;*               THE EXT. ENABLE BIT IS SET IS SCRATCH PAD 13.  THEN
                                ;*               DISABLE EXTENDED ERROR AND CHECK THAT THE ENABLE BIT
                                ;*               IS CLEAR.
                                ;*  SUBTEST 2  - SET REP/SEL TIMER VALUE AND SET THE DMR THRESHOLD
                                ;*               VALUES.  CHECK THAT THE VALUES ARE CORRECT IN
                                ;*               THE BASE TABLE AFTER HALTING THE DMR.
                                ;*
                                ;*
                                ;*******************************************************************
 026666                         BGNTST
 026666                                                                                  T5::
 026666                           BGNSUB
 026666                                                                                  T5.1:
 026666  104402                                                                                  TRAP    C$BSUB
 026670                                 CLEAR                    ;MACRO FOR MASTER CLEAR COMMAND
                                                                 ;**** MACRO EXPANSION ****
 026670  004737  011066                 JSR     PC, $MSCLR       ;ISSUE A DMR MASTER CLEAR
                                                                 ;****                   ****

 026674                                 ESCAPE  TST              ;IF ERROR, BR TO TEST END
 026674  104410                                                                                  TRAP    C$ESCAPE
 026676  000330                                                                                  .WORD   L10036-.

 026700                                 BASEIN                   ;BASE IN COMMAND WITH  LINE UNIT LOOP,
                                                                 ;**** MACRO EXPANSION ****
 026700  004737  011264                 JSR     PC, $BASEI       ;CALL BASE IN ROUTINE WITH DEFAULTS
 026704  004000                                 .WORD   LPLU     ;SET LINE UNIT LOOP
 026706  002636                                 .WORD   BASE     ;BASE TABLE ADDRESS
 026710  000522                                 .WORD   DMR      ;DMR-11 MODE
                                                                 ;****                   ****

 026712                                 ESCAPE  TST              ;IF ERROR, BR TO TEST END
 026712  104410                                                                                  TRAP    C$ESCAPE
 026714  000312                                                                                  .WORD   L10036-.
 026716                                 DMRIN   EXERR            ;ENABLE EXTENDED ERROR NOTIFICATION
                                                                 ;**** MACRO EXPANSION ****
 026716  004737  012060                 JSR     PC, $DMRIN       ;CALL DMR MODE INPUT ROUTINE
 026722  000006                                 .WORD   EXERR    ;INPUT COMMAND
 026724  000000                                 .WORD   0        ;NO SEL4
 026726  000000                                 .WORD   0        ;NO SEL6
                                                                 ;****                   ****

 026730                                 ESCAPE  TST              ;IF ERROR, BR TO TEST END
 026730  104410                                                                                  TRAP    C$ESCAPE
 026732  000274                                                                                  .WORD   L10036-.
 026734                                 SHUTDN                   ;HALT THE DMR
                                                                 ;**** MACRO EXPANSION ****
 026734  004737  012550                 JSR     PC, $HALT        ;DMR HALT ROUTINE.
                                                                 ;****                   ****
 026740                                 ESCAPE  TST              ;IF ERROR, BR TO TEST END
 026740  104410                                                                                  TRAP    C$ESCAPE
```

```
        026742  000264                                                                          .WORD   L10036-.
     30 026744  132737  000001  002734          BITB    #BIT0,BASE+ISP13 ;CHECK EXT ENABLE BIT IN THE BASE TABLE.
     31                                                                  ;IMAGE OF SCRATCH PAD 13.
     32 026752  001005                           BNE     10$              ;BIT SET - OK.
     33 026754                                   ERRDF   24,EMT7          ;ERROR EXT ENABLE CLEAR
        026754  104455                                                                          TRAP    C$ERDF
        026756  000030                                                                          .WORD   24
        026760  027536                                                                          .WORD   EMT7
        026762  000000                                                                          .WORD   0
     34 026764  000430                           BR      20$
     35 026766                            10$:
     36 026766                                   BASEIN  LPLU,BASE,RES!DMR ;BASE IN COMMAND WITH RESUME SET.
                                                                          ;**** MACRO EXPANSION ****
        026766  004737  011264                   JSR     PC, $BASEI       ;CALL BASE IN ROUTINE
        026772  004000                                   .WORD   LPLU     ;MAINTENANCE MODE BITS TO SET IN BSEL1
        026774  002636                                   .WORD   BASE     ;BASE TABLE ADDRESS
        026776  010522                                   .WORD   RES.DMR  ;MODE
                                                                          ;****                   ****
     37
     38 027000                                   DMRIN   DXERR            ;DISABLE EXTENDED ERROR NOTIFICATION.
                                                                          ;**** MACRO EXPANSION ****
        027000  004737  012060                   JSR     PC, $DMRIN       ;CALL DMR MODE INPUT ROUTINE
        027004  000007                                   .WORD   DXERR    ;INPUT COMMAND
        027006  000000                                   .WORD   0        ;NO SEL4
        027010  000000                                   .WORD   0        ;NO SEL6
                                                                          ;****                   ****
     39
     40 027012                                   ESCAPE  TST              ;IF ERROR, BR TO TEST END
        027012  104410                                                                          TRAP    C$ESCAPE
        027014  000212                                                                          .WORD   L10036-.
     41 027016                                   SHUTDN                   ;HALT THE DMR
                                                                          ;**** MACRO EXPANSION ****
        027016  004737  012550                   JSR     PC, $HALT        ;DMR HALT ROUTINE.
                                                                          ;****                   ****
     42 027022                                   ESCAPE  TST              ;IF ERROR, BR TO TEST END.
        027022  104410                                                                          TRAP    C$ESCAPE
        027024  000202                                                                          .WORD   L10036-.
     43 027026  132737  000001  002734          B!TB    #BIT0,BASE+ISP13 ;CHECK EXT ENABLE BIT IN THE BASE TABLE.
     44                                                                  ;IMAGE OF SCRATCH PAD 13.
     45 027034  001404                           BEQ     20$              ;IF CLEAR OK
     46 027036                                   ERRDF   24,EMT7          ;ERROR EXT ENABLE SET
        027036  104455                                                                          TRAP    C$ERDF
        027040  000030                                                                          .WORD   24
        027042  027536                                                                          .WORD   EMT7
        027044  000000                                                                          .WORD   0
     47 027046                            20$:
     48 027046                              ENDSUB
        027046                                                                          L10037:
        027046  104403                                                                          TRAP    C$FSUB
     49
     50 027050                              BGNSUB
        027050                                                                          T5.2:
        027050  104402                                                                          TRAP    C$BSUB
     51 027052                                   CLEAR                    ;MACRO FOR MASTER CLEAR COMMAND
                                                                          ;**** MACRO EXPANSION ****
        027052  004737  011066                   JSR     PC, $MSCLR       ;ISSUE A DMR MASTER CLEAR
                                                                          ;****                   ****
```

```
 52
 53 027056                                  ESCAPE  TST              ;IF ERROR, BR TO TEST END
    027056  104410                                                                                TRAP    C$ESCAPE
    027060  000146                                                                                .WORD   L10036-.
 54
 55 027062                                  BASEIN                   ;BASE IN COMMAND WITH  LINE UNIT LOOP,
                                                                     ;**** MACRO EXPANSION ****
    027062  004737  011264                  JSR     PC, $BASEI       ;CALL BASE IN ROUTINE WITH DEFAULTS
    027066  004000                                  .WORD   LPLU     ;SET LINE UNIT LOOP
    027070  002636                                  .WORD   BASE     ;BASE TABLE ADDRESS
    027072  000522                                  .WORD   DMR      ;DMR-11 MODE
                                                                     ;****                   ****
 56
 57 027074                                  ESCAPE  TST              ;IF ERROR, BR TO TEST END
    027074  104410                                                                                TRAP    C$ESCAPE
    027076  000130                                                                                .WORD   L10036-.
 58 027100                                  DMRIN   TIMER,0,54       ;SET REP/SELECT TIMER VALUE
                                                                     ;**** MACRO EXPANSION ****
    027100  004737  012060                  JSR     PC, $DMRIN       ;CALL DMR MODE INPUT ROUTINE
    027104  000012                                  .WORD   TIMER    ;INPUT COMMAND
    027106  000000                                  .WORD   0        ;SEL4 VALUE (OR BITS TO CLEAR IN BSEL6)
    027110  000054                                  .WORD   54       ;SEL6 VALUE (OR BITS TO SET IN BSEL6)
                                                                     ;****                   ****
 59
 60 027112                                  ESCAPE  TST              ;IF ERROR, BR TO TEST END
    027112  104410                                                                                TRAP    C$ESCAPE
    027114  000112                                                                                .WORD   L10036-.
 61
 62                                                                  ;SET THRESHOLD VALUES AS FOLLOWS:
 63                                                                  ;BSEL4 = NAKS RECEIVED (3)
 64                                                                  ;BSEL5 = NAKS TRANSMITTED (13)
 65                                                                  ;BSEL6 = REP/SEL SENT (15)
 66                                                                  ;BSEL7 = NO BUFFFER (4)
 67 027116                                  DMRIN   THRESH,5403,2015
                                                                     ;**** MACRO EXPANSION ****
    027116  004737  012060                  JSR     PC, $DMRIN       ;CALL DMR MODE INPUT ROUTINE
    027122  000013                                  .WORD   THRESH   ;INPUT COMMAND
    027124  005403                                  .WORD   5403     ;SEL4 VALUE (OR BITS TO CLEAR IN BSEL6)
    027126  002015                                  .WORD   2015     ;SEL6 VALUE (OR BITS TO SET IN BSEL6)
                                                                     ;****                   ****
 68
 69 027130                                  ESCAPE  TST              ;IF ERROR, BR TO TEST END
    027130  104410                                                                                TRAP    C$ESCAPE
    027132  000074                                                                                .WORD   L10036-.
 70 027134                                  SHUTDN                   ;HALT THE DMR.
                                                                     ;**** MACRO EXPANSION ****
    027134  004737  012550                  JSR     PC, $HALT        ;DMR HALT ROUTINE.
                                                                     ;****                   ****
 71 027140                                  ESCAPE  TST              ;IF ERROR, BR TO TEST END
    027140  104410                                                                                TRAP    C$ESCAPE
    027142  000064                                                                                .WORD   L10036-.
 72 027144  122737  000054  002713          CMPB    #54,BASE+PRETIM  ;CHECK REP/SEL TIME IN BASE TABLE.
 73 027152  001020                          BNE     10$              ;IF NOT 54, BR TO ERROR.
 74 027154  122737  000015  002722          CMPB    #15,BASE+TH3L    ;CHECK REP. THRESH. IN BASE TABLE.
 75 027162  001014                          BNE     10$              ;IF NOT 15, BR TO ERROR.
 76 027164  122737  000003  002716          CMPB    #3,BASE+TH1L     ;CHECK NAK RCVD. THRESH. IN BASE TABLE.
 77 027172  001010                          BNE     10$              ;IF NOT 3, BR TO ERROR.
```

```
     78 027174  122737  000013  002720          CMPB    #13,BASE+TH2L   ;CHECK NAK SENT THRESH. IN BASE TABLE.
     79 027202  001004                          BNE     10$             ;IF NOT 13, BR TO ERROR
     80 027204  122737  000004  002724          CMPB    #4,BASE+TH4L    ;CHECK NO BUF. THRESH. IN BASE TABLE.
     81 027212  001404                          BEQ     20$             ;IF 4, ALL CHECKS OK - EXIT
     82 027214                          10$:
     83 027214                                  ERRDF   24,EMT8,ERRT3
        027214  104455                                                                          TRAP    C$ERDF
        027216  000030                                                                          .WORD   24
        027220  027567                                                                          .WORD   EMT8
        027222  027230                                                                          .WORD   ERRT3
     84 027224                          20$:
     85 027224                            ENDSUB
        027224                                                                  L10040:
        027224  104403                                                                          TRAP    C$ESUB
     86 027226                          ENDTST
        027226                                                                  L10036:
        027226  104401                                                                          TRAP    C$ETST
     87
     88 027230                          BGNMSG  ERRT3
        027230                                                                  ERRT3::
     89 027230                                  PRINTB  #FMG1,@SEL0,@SEL2 ;PRINT SEL0 AND SEL2
        027230  017746  153000                                                                  MOV     @SEL2,-(SP)
        027234  017746  152772                                                                  MOV     @SEL0,-(SP)
        027240  012746  016270                                                                  MOV     #FMG1,-(SP)
        027244  012746  000003                                                                  MOV     #3,-(SP)
        027250  010600                                                                          MOV     SP,R0
        027252  104414                                                                          TRAP    C$PNTB
        027254  062706  000010                                                                  ADD     #10,SP
     90 027260                                  PRINTB  #FMT11,<B,BASE+ISP13> ;PRINT OUT THE IMAGE OF SCRATCH PAD 13.
        027260  005046                                                                          CLR     -(SP)
        027262  153716  002734                                                                  BISB    BASE+ISP13,(SP)
        027266  012746  027624                                                                  MOV     #FMT11,-(SP)
        027272  012746  000002                                                                  MOV     #2,-(SP)
        027276  010600                                                                          MOV     SP,R0
        027300  104414                                                                          TRAP    C$PNTB
        027302  062706  000006                                                                  ADD     #6,SP
     91 027306  122737  000054  002713          CMPB    #54,BASE+PRETIM ;IS REP/SEL TIME OK?
     92 027314  001413                          BEQ     1$              ;BR IF OK
     93 027316                                  PRINTB  #FMT12,<B,BASE+PRETIM> ;PRINT IT OUT.
        027316  005046                                                                          CLR     -(SP)
        027320  153716  002713                                                                  BISB    BASE+PRETIM,(SP)
        027324  012746  027655                                                                  MOV     #FMT12,-(SP)
        027330  012746  000002                                                                  MOV     #2,-(SP)
        027334  010600                                                                          MOV     SP,R0
        027336  104414                                                                          TRAP    C$PNTB
        027340  062706  000006                                                                  ADD     #6,SP
     94 027344                          1$:
     95 027344  122737  000003  002716          CMPB    #3,BASE+TH1L    ;IS NAK RCVD OK?
     96 027352  001413                          BEQ     2$              ;BR IF OK.
     97 027354                                  PRINTB  #FMT13,<B,BASE+TH1L> ;PRINT IT OUT
        027354  005046                                                                          CLR     -(SP)
        027356  153716  002716                                                                  BISB    BASE+TH1L,(SP)
        027362  012746  027712                                                                  MOV     #FMT13,-(SP)
        027366  012746  000002                                                                  MOV     #2,-(SP)
        027372  010600                                                                          MOV     SP,R0
        027374  104414                                                                          TRAP    C$PNTB
        027376  062706  000006                                                                  ADD     #6,SP
```

```
 98 027402                                2$:
 99 027402  122737  000013  002720              CMPB    #13,BASE+TH2L    ;IS NAK SENT OK?
100 027410  001413                              BEQ     3$               ;BR IF OK.
101 027412                                      PRINTB  #FMT14,<B,BASE+TH2L> ;PRINT IT OUT
    027412  005046                                                                          CLR     -(SP)
    027414  153716  002720                                                                  BISB    BASE+TH2L,(SP)
    027420  012746  027747                                                                  MOV     #FMT14,-(SP)
    027424  012746  000002                                                                  MOV     #2,-(SP)
    027430  010600                                                                          MOV     SP,R0
    027432  104414                                                                          TRAP    C$PNTB
    027434  062706  000006                                                                  ADD     #6,SP
102 027440                                3$:
103 027440  122737  000015  002722              CMPB    #15,BASE+TH3L    ;IS REP LEVEL OK?
104 027446  001413                              BEQ     4$               ;BR IF OK.
105 027450                                      PRINTB  #FMT15,<B,BASE+TH3L> ;PRINT IT OUT
    027450  005046                                                                          CLR     -(SP)
    027452  153716  002722                                                                  BISB    BASE+TH3L,(SP)
    027456  012746  030004                                                                  MOV     #FMT15,-(SP)
    027462  012746  000002                                                                  MOV     #2,-(SP)
    027466  010600                                                                          MOV     SP,R0
    027470  104414                                                                          TRAP    C$PNTB
    027472  062706  000006                                                                  ADD     #6,SP
106 027476                                4$:
107 027476  122737  000004  002724              CMPB    #4,BASE+TH4L     ;IS NO BUFFER LEVEL OK?
108 027504  001413                              BEQ     5$               ;BR IF OK.
109 027506                                      PRINTB  #FMT16,<B,BASE+TH4L> ;PRINT IT OUT
    027506  005046                                                                          CLR     -(SP)
    027510  153716  002724                                                                  BISB    BASE+TH4L,(SP)
    027514  012746  030041                                                                  MOV     #FMT16,-(SP)
    027520  012746  000002                                                                  MOV     #2,-(SP)
    027524  010600                                                                          MOV     SP,R0
    027526  104414                                                                          TRAP    C$PNTB
    027530  062706  000006                                                                  ADD     #6,SP
110 027534                                5$:
111 027534                                ENDMSG
    027534                                                                      L10041:
    027534  104423                                                                          TRAP    C$MSG
112
113
114 027536     105     130     124  EMT7:    .ASCIZ  /EXT. ERROR BIT INCORRECT/
    027541     056     040     105
    027544     122     122     117
    027547     122     040     102
    027552     111     124     040
    027555     111     116     103
    027560     117     122     122
    027563     105     103     124
    027566     000
115 027567     104     115     122  EMT8:    .ASCIZ  /DMR MODE INPUT COMMAND ERROR/
    027572     040     115     117
    027575     104     105     040
    027600     111     116     120
    027603     125     124     040
    027606     103     117     115
    027611     115     101     116
    027614     104     040     105
    027617     122     122     117
```

```
        027622     122     000
    116
    117 027624     045     101     111  FMT11:  .ASCIZ  /%AIMAGE OF SP 13 = %D3%N/
        027627     115     101     107
        027632     105     040     117
        027635     106     040     123
        027640     120     040     061
        027643     063     040     075
        027646     040     045     104
        027651     063     045     116
        027654     000
    118 027655     045     101     122  FMT12:  .ASCIZ  /%AREP-SEL TIME VALUE = %D3%N/
        027660     105     120     055
        027663     123     105     114
        027666     040     124     111
        027671     115     105     040
        027674     126     101     114
        027677     125     105     040
        027702     075     040     045
        027705     104     063     045
        027710     116     000
    119 027712     045     101     116  FMT13:  .ASCIZ  /%ANAK RCVD THRESHOLD = %D3%N/
        027715     101     113     040
        027720     122     103     126
        027723     104     040     124
        027726     110     122     105
        027731     123     110     117
        027734     114     104     040
        027737     075     040     045
        027742     104     063     045
        027745     116     000
    120 027747     045     101     116  FMT14:  .ASCIZ  /%ANAK SENT THRESHOLD = %D3%N/
        027752     101     113     040
        027755     123     105     116
        027760     124     040     124
        027763     110     122     105
        027766     123     110     117
        027771     114     104     040
        027774     075     040     045
        027777     104     063     045
        030002     116     000
    121 030004     045     101     122  FMT15:  .ASCIZ  /%AREP SENT THRESHOLD = %D3%N/
        030007     105     120     040
        030012     123     105     116
        030015     124     040     124
        030020     110     122     105
        030023     123     110     117
        030026     114     104     040
        030031     075     040     045
        030034     104     063     045
        030037     116     000
    122 030041     045     101     116  FMT16:  .ASCIZ  /%ANO BUFFER THRESHOLD = %D3%N/
        030044     117     040     102
        030047     125     106     106
        030052     105     122     040
        030055     124     110     122
        030060     105     123     110
```

```
        030063     117     114     104
        030066     040     075     040
        030071     045     104     063
        030074     045     116     000
    123                                         .EVEN
    124
    125
```

```
                                .SBTTL          TEST 6 - CONTROL IN COMMAND

                                ;*****************************************************************
                                ;*              TEST 6 - DMR-11
                                ;*  CONTROL IN COMMAND TEST -
                                ;*  SUBTEST 1  - CONTROL IN, FULL DUPLEX, DDCMP MODE.  ENSURE THAT
                                ;*               THE HALF-DUPLEX BIT IS CLEAR IN THE MODEM STATUS WORD,
                                ;*               ALSO ENSURE THAT DDCMP MODE BIT IS SET IN SCRATCH PAD 7.
                                ;*  SUBTEST 2  - CONTROL IN, HALF DUPLEX.  ENSURE THAT THE HALF DUPLEX
                                ;*               BIT IS SET.
                                ;*  SUBTEST 3  - CONTROL IN, MAINTENANCE MODE.  ENSURE THAT MAINT. MODE
                                ;*               BIT IS SET IN SCRATCH PAD 7.
                                ;*  SUBTEST 4  - CONTROL IN USING SELECTED LOOPBACK.  ISSUE A CONTROL IN
                                ;*               USING THE USER SELECTED LOOPBACK.  IF THE LOOPBACK IS
                                ;*               NOT CORRECT, DMR RUN MODE ACKNOWLEDGE WILL NOT BE
                                ;*               RECEIVED.
                                ;*
                                ;*
                                ;*****************************************************************
 030100                         BGNTST
 030100                                                                          T6::
 030100                           BGNSUB
 030100                                                                          T6.1:
 030100  104402                                                                          TRAP    C$BSUB
 030102                                  CLEAR                   ;MACRO FOR MASTER CLEAR
                                                                 ;**** MACRO EXPANSION ****
 030102  004737  011066                  JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                                 ;****                   ****

 030106                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
 030106  104410                                                                          TRAP    C$ESCAPE
 030110  000404                                                                          .WORD   L10042-.
 030112                                  BASEIN                  ;MACRO FOR BASE IN COMMAND
                                                                 ;**** MACRO EXPANSION ****
 030112  004737  011264                  JSR     PC, $BASEI      ;CALL BASE IN ROUTINE WITH DEFAULTS
 030116  004000                                  .WORD   LPLU    ;SET LINE UNIT LOOP
 030120  002636                                  .WORD   BASE    ;BASE TABLE ADDRESS
 030122  000522                                  .WORD   DMR     ;DMR-11 MODE
                                                                 ;****                   ****

 030124                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
 030124  104410                                                                          TRAP    C$ESCAPE
 030126  000366                                                                          .WORD   L10042-.
 030130                                  CNTRIN                  ;MACRO FOR CONTROL IN (FULL DUPLEX)
                                                                 ;**** MACRO EXPANSION ****
 030130  004737  011520                  JSR     PC, $CNTIN      ;CALL CONTROL IN ROUTINE WITH DEFAULT
 030134  000000                                  .WORD   0       ;SEL6 - FULL DUPLEX, RUN MODE, 1 SEC START.
                                                                 ;****                   ****

 030136                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
 030136  104410                                                                          TRAP    C$ESCAPE
 030140  000354                                                                          .WORD   L10042-.

 030142  052777  000057  152062          BIS     #RQI!RMODEM,@SEL0 ;SET RQI AND READ MODEM COMMAND
 030150                                  WAIT    RDI             ;WAIT FOR RDI TO BE SET
                                                                 ;**** MACRO EXPANSION ****
 030150  004737  010274                  JSR     PC, $WAIT       ;CALL WAIT ROUTINE
```

```
        030154  000000                                  .WORD   0       ;FLAG THAT WE'RE WAITING FOR RDI
                                                                        ;****                   ****
     34 030156  032777  000020  152052          BIT     #BIT4,@SEL4     ;IS THE HDX BIT SET IN MODEM STATUS REG?
     35 030164  001404                          BEQ     10$             ;OK - IF BIT CLEAR
     36 030166                                  ERRDF   21,EMT9         ;ERROR HDX BIT SET
        030166  104455                                                                          TRAP    C$ERDF
        030170  000025                                                                          .WORD   21
        030172  030516                                                                          .WORD   EMT9
        030174  000000                                                                          .WORD   0
     37 030176                          10$:
     38 030176                                  WAIT    RQI             ;CLEAR RQI AND WAIT FOR RDI TO CLEAR.
                                                                        ;**** MACRO EXPANSION ****
        030176  004737  010704                  JSR     PC, $CLRQI      ;CLEAR RQI AND WAIT FOR IT TO BE CLEARED.
                                                                        ;****                   ****
     39 030202                                  SHUTDN                  ;HALT DMR
                                                                        ;**** MACRO EXPANSION ****
        030202  004737  012550                  JSR     PC, $HALT       ;DMR HALT ROUTINE.
                                                                        ;****                   ****
     40 030206                                  ESCAPE  TST             ;IF ERROR, EXIT.
        030206  104410                                                                          TRAP    C$ESCAPE
        030210  000304                                                                          .WORD   L10042-.
     41 030212  132737  000020  002730          BITB    #BIT4,BASE+ISP7 ;IS THE DDCMP RUN BI SET IN IMAGE OF SP 7.
     42 030220  001004                          BNE     20$
     43 030222                                  ERRDF   21,EMT10                ;ERROR DDCMP RUN BIT NOT SET
        030222  104455                                                                          TRAP    C$ERDF
        030224  000025                                                                          .WORD   21
        030226  030546                                                                          .WORD   EMT10
        030230  000000                                                                          .WORD   0
     44 030232                          20$:
     45 030232                            ENDSUB
        030232                                                                          L10043:
        030232  104403                                                                          TRAP    C$ESUB
     46
     47 030234                            BGNSUB
        030234                                                                          T6.2:
        030234  104402                                                                          TRAP    C$BSUB
     48 030236                                  BASEIN  LPLU,BASE,RES!DMR ;BASE IN WITH RESUME.
                                                                        ;**** MACRO EXPANSION ****
        030236  004737  011264                  JSR     PC, $BASEI      ;CALL BASE IN ROUTINE
        030242  004000                                  .WORD   LPLU    ;MAINTENANCE MODE BITS TO SET IN BSEL1
        030244  002636                                  .WORD   BASE    ;BASE TABLE ADDRESS
        030246  010522                                  .WORD   RES!DMR ;MODE
                                                                        ;****                   ****
     49
     50 030250                                  CNTRIN  HDX             ;CONTROL IN COMMAND WITH HDX.
                                                                        ;**** MACRO EXPANSION ****
        030250  004737  011520                  JSR     PC, $CNTIN      ;CALL CONTROL IN ROUTINE
        030254  002000                                  .WORD   HDX     ;SEL6 - (DUPLEX, MODE)
                                                                        ;****                   ****
     51
     52 030256                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
        030256  104410                                                                          TRAP    C$ESCAPE
        030260  000234                                                                          .WORD   L10042-.
     53 030262  052777  000057  151742          BIS     #RQI!RMODEM,@SEL0 ;SET RQI AND READ MODEM COMMAND
     54 030270                                  WAIT    RDI             ;WAIT FOR RDI TO BE SET
                                                                        ;**** MACRO EXPANSI N ****
        030270  004737  010274                  JSR     PC, $WAIT       ;CALL WAIT ROUTINE
```

```
        030274  000000                                  .WORD   0       ;FLAG THAT WE'RE WAITING FOR RDI
                                                                        ;****                   ****
     55 030276  032777  000020  151732          BIT     #BIT4,@SEL4     ;IS THE HDX BIT SET IN MODEM STATUS REG?
     56 030304  001004                          BNE     10$             ;OK - IF BIT SET
     57 030306                                  ERRDF   21,EMT11                ;ERROR HDX BIT CLEAR.
        030306  104455                                                                          TRAP    C$ERDF
        030310  000025                                                                          .WORD   21
        030312  030574                                                                          .WORD   EMT11
        030314  000000                                                                          .WORD   0
     58 030316                          10$:
     59 030316                                  SHUTDN                  ;HALT THE DMR.
                                                                        ;**** MACRO EXPANSION ****
        030316  004737  012550                  JSR     PC, $HALT       ;DMR HALT ROUTINE.
                                                                        ;****                   ****
     60
     61 030322                          ENDSUB
        030322                                                                          L10044:
        030322  104403                                                                          TRAP    C$ESUB
     62
     63 030324                          BGNSUB
        030324                                                                          T6.3:
        030324  104402                                                                          TRAP    C$BSUB
     64 030326                                  CLEAR                   ;MACRO FOR MASTER CLEAR
                                                                        ;**** MACRO EXPANSION ****
        030326  004737  011066                  JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                                        ;****                   ****
     65
     66 030332                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
        030332  104410                                                                          TRAP    C$ESCAPE
        030334  000160                                                                          .WORD   L10042-.
     67 030336                                  BASEIN                  ;MACRO FOR BASE IN COMMAND
                                                                        ;**** MACRO EXPANSION ****
        030336  004737  011264                  JSR     PC, $BASEI      ;CALL BASE IN ROUTINE WITH DEFAULTS
        030342  004000                                  .WORD   LPLU    ;SET LINE UNIT LOOP
        030344  002636                                  .WORD   BASE    ;BASE TABLE ADDRESS
        030346  000522                                  .WORD   DMR     ;DMR-11 MODE
                                                                        ;****                   ****
     68
     69 030350                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
        030350  104410                                                                          TRAP    C$ESCAPE
        030352  000142                                                                          .WORD   L10042-.
     70 030354                                  CNTRIN  MAINT           ;MACRO FOR CONTROL IN (MAINT. MODE)
                                                                        ;**** MACRO EXPANSION ****
        030354  004737  011520                  JSR     PC, $CNTIN      ;CALL CONTROL IN ROUTINE
        030360  000400                                  .WORD   MAINT   ;SEL6 - (DUPLEX, MODE)
                                                                        ;****                   ****
     71
     72 030362                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
        030362  104410                                                                          TRAP    C$ESCAPE
        030364  000130                                                                          .WORD   L10042-.
     73 030366                                  SHUTDN                  ;HALT
                                                                        ;**** MACRO EXPANSION ****
        030366  004737  012550                  JSR     PC, $HALT       ;DMR HALT ROUTINE.
                                                                        ;****                   ****
     74 030372                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
        030372  104410                                                                          TRAP    C$ESCAPE
        030374  000120                                                                          .WORD   L10042-.
```

```
 75 030376  132737  000002  002730          BITB    #BIT1,BASE+ISP7 ;IS THE MAINTENANCE BIT SET IN IMAGE OF SP 7.
 76 030404  001004                          BNE     10$
 77 030406                                  ERRDF   21,EMT12        ;ERROR - MAINT. BIT NOT SET.
    030406  104455                                                                                  TRAP    C$ERDF
    030410  000025                                                                                  .WORD   21
    030412  030630                                                                                  .WORD   EMT12
    030414  000000                                                                                  .WORD   0
 78 030416                            10$:
 79 030416                              ENDSUB
    030416                                                                                  L10045:
    030416  104403                                                                                  TRAP    C$ESUB
 80
 81 030420                              BGNSUB
    030420                                                                                  T6.4:
    030420  104402                                                                                  TRAP    C$BSUB
 82
 83 030422                                  CLEAR                   ;MACRO FOR MASTER CLEAR
                                                                    ;**** MACRO EXPANSION ****
    030422  004737  011066                  JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                                    ;****                   ****
 84
 85 030426                                  ESCAPE  TST             ;IF ERROR, BR TO TESI END.
    030426  104410                                                                                  TRAP    C$ESCAPE
    030430  000064                                                                                  .WORD   L10042-.
 86 030432  005737  002254                  TST     DMTURN          ;IS INTERNAL LOOPBACK REQUESTED?
 87 030436  001004                          BNE     1$              ;IF NOT, BR
 88 030440  052737  004000  030462          BIS     #LPLU,100$      ;SET LINE UNIT LOOPBACK.
 89 030446  000403                          BR      2$
 90 030450                            1$:
 91 030450  042737  004000  030462          BIC     #LPLU,100$      ;CLEAR LINE UNIT LOOPBACK.
 92 030456                            2$:
 93 030456                                  CALL    $BASEI          ;BASE IN COMMAND.
 94 030462  000000                    100$:         .WORD   0       ;MAINTENANCE BITS (L. U. LOOPBACK?)
 95 030464  002636                                  .WORD   BASE    ;BASE TABLE ADDRESS.
 96 030466  000522                                  .WORD   DMR     ;DMR MODE.
 97 030470                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
    030470  104410                                                                                  TRAP    C$ESCAPE
    030472  000022                                                                                  .WORD   L10042-.
 98 030474                                  CALL    $LOOP           ;EXTENDED DMR COMMAND TO SET MAINT. BITS
 99                                                                 ;IF NEEDED. THIS WILL ALLOW MODEM LOOPBACK
100                                                                 ;IF THE USER REQUESTED IT.
101 030500                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
    030500  104410                                                                                  TRAP    C$ESCAPE
    030502  000012                                                                                  .WORD   L10042-.
102 030504                                  CNTRIN                  ;MACRO FOR CONTROL IN (FULL DUPLEX)
                                                                    ;**** MACRO EXPANSION ****
    030504  004737  011520                  JSR     PC, $CNTIN      ;CALL CONTROL IN ROUTINE WITH DEFAULT
    030510  000000                                  .WORD   0       ;SEL6 - FULL DUPLEX, RUN MODE, 1 SEC START.
                                                                    ;****                   ****
103 030512                              ENDSUB
    030512                                                                                  L10046:
    030512  104403                                                                                  TRAP    C$ESUB
104
105
106
107 030514                            ENDTST
    030514                                                                                  L10042:
```

```
        030514  104401                                                                    TRAP    CSETST
    108
    109 030516      110     104     130  EMT9:   .ASCIZ  /HDX BIT SET WHEN IN FDX/
        030521      040     102     111
        030524      124     040     123
        030527      105     124     040
        030532      127     110     105
        030535      116     040     111
        030540      116     040     106
        030543      104     130     000
    110 030546      104     104     103  EMT10:  .ASCIZ  /DDCMP RUN BIT NOT SET/
        030551      115     120     040
        030554      122     125     116
        030557      040     102     111
        030562      124     040     116
        030565      117     124     040
        030570      123     105     124
        030573      000
    111 030574      110     104     130  EMT11:  .ASCIZ  /HDX BIT NOT SET WHEN IN HDX/
        030577      040     102     111
        030602      124     040     116
        030605      117     124     040
        030610      123     105     124
        030613      040     127     110
        030616      105     116     040
        030621      111     116     040
        030624      110     104     130
        030627      000
    112 030630      115     101     111  EMT12:  .ASCIZ  /MAINT. MODE BIT NOT SET/
        030633      116     124     056
        030636      040     115     117
        030641      104     105     040
        030644      102     111     124
        030647      040     116     117
        030652      124     040     123
        030655      105     124     000
    113                                          .EVEN
    114
    115
    116
```

```
                                .SBTTL          TEST 7 - MODEM WRITE COMMAND

                                ;*******************************************************************
                                ;*              TEST 7 - DMR-11
                                ;* MODEM WRITE COMMAND
                                ;*  SUBTEST 1  - WRITE DATA PATTERNS INTO THE MODEM WRITE REGISTER.
                                ;*               ENSURE THAT ON THE NEXT MODEM READ THAT THE
                                ;*               MICROCODE RETURNS THE PATTERN WRITTEN INTO BSEL6.
                                ;*  SUBTEST 2  - ATTEMPT TO WRITE BOTH THE HALF-DUPLEX BIT AND THE
                                ;*               RTS HOLD BIT.  THE MICROCODE SHOULD NOT ALLOW THIS
                                ;*               TO HAPPEN.  WHEN READING THE MODEM STATUS, ONLY
                                ;*               THE HALF-DUPLEX SHOULD BE SET.
                                ;*
                                ;*******************************************************************
 030660                         BGNTST
 030660                                                                                  T7::

 030660                           BGNSUB
 030660                                                                                  T7.1:
 030660  104402                                                                                  TRAP    C$BSUB
 030662                                 CLEAR                    ;MACRO FOR MASTER CLEAR
                                                                 ;**** MACRO EXPANSION ****
 030662  004737  011066                 JSR     PC, $MSCLR       ;ISSUE A DMR MASTER CLEAR
                                                                 ;****                   ****

 030666                                 ESCAPE  TST              ;IF ERROR, BR TO TEST END.
 030666  104410                                                                                  TRAP    C$ESCAPE
 030670  000232                                                                                  .WORD   L10047-.
 030672                                 BASEIN                   ;BASE IN COMMAND.
                                                                 ;**** MACRO EXPANSION ****
 030672  004737  011264                 JSR     PC, $BASEI       ;CALL BASE IN ROUTINE WITH DEFAULTS
 030676  004000                                 .WORD   LPLU     ;SET LINE UNIT LOOP
 030700  002636                                 .WORD   BASE     ;BASE TABLE ADDRESS
 030702  000522                                 .WORD   DMR      ;DMR-11 MODE
                                                                 ;****                   ****

 030704                                 ESCAPE  TST              ;IF ERROR, BR TO TEST END.
 030704  104410                                                                                  TRAP    C$ESCAPE
 030706  000214                                                                                  .WORD   L10047-.

 030710  012701  000005                 MOV     #5,R1            ;COUNTER
 030714  012702  031124                 MOV     #MODEM,R2        ;PATTERN TO WRITE INTO MODEM
 030720                         10$:
 030720  012237  030734                 MOV     (R2)+,15$        ;WRITE PATTERN
 030724  004737  012060                 JSR     PC,$DMRIN        ;ISSUE DMR MODE COMMAND
 030730  000005                                 .WORD   WMODEM   ;WRITE MODEM COMMNAD
 030732  000377                                 .WORD   377      ;CLEAR ALL BITS IN BSEL6
 030734  000000                 15$:            .WORD   0        ;SET THE BITS IN BSEL6 (FROM PATTERN)
 030736                                 ESCAPE  TST              ;IF ERROR, BR TO TEST END.
 030736  104410                                                                                  TRAP    C$ESCAPE
 030740  000162                                                                                  .WORD   L10047-.

 030742  052777  000057  151262         BIS     #RQI!RMODEM,@SEL0 ;SET RQI AND READ  MODEM COMMAND
 030750                                 WAIT    RDI              ;WAIT FOR RDI TO BE SET.
                                                                 ;**** MACRO EXPANSION ****
 030750  004737  010274                 JSR     PC, $WAIT        ;CALL WAIT ROUTINE
 030754  000000                                 .WORD   0        ;FLAG THAT WE'RE WAITING FOR RDI
```

```
                                                                    ;****                    ****
 37 030756                                  ESCAPE  TST             ;IF ERROR, EXIT TEST.
    030756  104410                                                                              TRAP    C$ESCAPE
    030760  000142                                                                              .WORD   L10047-.
 38 030762                          20$:
 39 030762  127737  151252  030734          CMPB    @BSEL6,15$      ;DID THE MICROCODE COPY THE BITS?
 40 030770  001406                          BEQ     25$             ;IF YES CONTINUE
 41 030772  013703  030734                  MOV     15$,R3          ;SAVE THE PATTERN FOR THE ERROR MESSAGE.
 42 030776                                  ERRDF   22,EMT13,ERRT2  ;WRITE MODEM ERROR
    030776  104455                                                                              TRAP    C$ERDF
    031000  000026                                                                              .WORD   22
    031002  031170                                                                              .WORD   EMT13
    031004  031136                                                                              .WORD   ERRT2
 43 031006                          25$:
 44 031006                                  WAIT    RQI             ;CLEAR RQI AND WAIT FOR RDI TO CLEAR.
                                                                    ;**** MACRO EXPANSION ****
    031006  004737  010704                  JSR     PC, $CLRQI      ;CLEAR RQI AND WAIT FOR IT TO BE CLEARED
                                                                    ;****                    ****
 45 031012                                  ESCAPE  TST             ;IF ERROR, EXIT TEST.
    031012  104410                                                                              TRAP    C$ESCAPE
    031014  000106                                                                              .WORD   L10047-.
 46 031016  005301                          DEC     R1              ;DECREMENT COUNTER
 47 031020  001337                          BNE     10$             ;CONTINUE UNTIL ALL 5 PATTERNS TRIED.
 48 031022                          30$:
 49
 50 031022                            ENDSUB
    031022                                                                      L10050:
    031022  104403                                                                              TRAP    C$ESUB
 51
 52 031024                            BGNSUB
    031024                                                                      T7.2:
    031024  104402                                                                              TRAP    C$BSUB
 53
 54 031026                                  DMRIN   WMODEM,377,21   ;ATTEMPT TO WRITE MODEM HDX AND RTS.
                                                                    ;**** MACRO EXPANSION ****
    031026  004737  012060                  JSR     PC, $DMRIN      ;CALL DMR MODE INPUT ROUTINE
    031032  000005                                  .WORD   WMODEM  ;INPUT COMMAND
    031034  000377                                  .WORD   377     ;SEL4 VALUE (OR BITS TO CLEAR IN BSEL6)
    031036  000021                                  .WORD   21      ;SEL6 VALUE (OR BITS TO SET IN BSEL6)
                                                                    ;****                    ****
 55
 56 031040                                  ESCAPE  TST             ;IF ERROR, BR TO END.
    031040  104410                                                                              TRAP    C$ESCAPE
    031042  000060                                                                              .WORD   L10047-.
 57 031044  052777  000057  151160          BIS     #RQI!RMODEM,@SEL0 ;SET RQI AND READ MODEM COMMAND.
 58 031052                                  WAIT    RDI             ;WAIT FOR RDI TO BE SET
                                                                    ;**** MACRO EXPANSION ****
    031052  004737  010274                  JSR     PC, $WAIT       ;CALL WAIT ROUTINE
    031056  000000                                  .WORD   0       ;FLAG THAT WE'RE WAITING FOR RDI
                                                                    ;****                    ****
 59 031060                                  ESCAPE  TST             ;IF ERROR, EXIT TEST.
    031060  104410                                                                              TRAP    C$ESCAPE
    031062  000040                                                                              .WORD   L10047-.
 60
 61 031064  122777  000020  151146          CMPB    #20,@BSEL6      ;IS ONLY HDX SET?
 62 031072  001406                          BEQ     10$             ;IF YES - OK
 63 031074  012703  000021                  MOV     #21,R3          ;SAVE THE PATTERN FOR THE ERROR MESSAGE.
```

```
 64 031100                                  ERRDF   22,EMT13,ERRT2
    031100  104455                                                                          TRAP    C$ERDF
    031102  000026                                                                          .WORD   22
    031104  031170                                                                          .WORD   EMT13
    031106  031136                                                                          .WORD   ERRT2
 65 031110                          10$:
 66 031110                                  WAIT    RQI             ;CLEAR RQI AND WAIT FOR RDI TO CLEAR.
                                                                    ;**** MACRO EXPANSION ****
    031110  004737  010704                  JSR     PC, $CLRQI      ;CLEAR RQI AND WAIT FOR IT TO BE CLEARED.
                                                                    ;****                   ****
 67 031114                                  SHUTDN
                                                                    ;**** MACRO EXPANSION ****
    031114  004737  012550                  JSR     PC, $HALT       ;DMR HALT ROUTINE.
                                                                    ;****                   ****
 68
 69 031120                            ENDSUB
    031120                                                                      L10051:
    031120  104403                                                                          TRAP    C$ESUB
 70
 71 031122                          ENDTST
    031122                                                                      L10047:
    031122  104401                                                                          TRAP    C$ETST
 72
 73 031124  000000  000376  000001  MODEM:  .WORD   0,376,1,252,357 ;PATTERN TO WRITE INTO MODEM
    031132  000252  000357
 74
 75 031136                          BGNMSG  ERRT2
    031136                                                                      ERRT2::
 76 031136                                  PRINTB  #FMT19,R3,<B,@BSEL6>
    031136  005046                                                                          CLR     -(SP)
    031140  157716  151074                                                                  BISB    @BSEL6,(SP)
    031144  010346                                                                          MOV     R3,-(SP)
    031146  012746  031214                                                                  MOV     #FMT19,-(SP)
    031152  012746  000003                                                                  MOV     #3,-(SP)
    031156  010600                                                                          MOV     SP,R0
    031160  104414                                                                          TRAP    C$PNTB
    031162  062706  000010                                                                  ADD     #10,SP
 77 031166                          ENDMSG
    031166                                                                      L10052:
    031166  104423                                                                          TRAP    C$MSG
 78
 79
 80 031170     127     122     111  EMT13:  .ASCIZ  /WRITE MODEM ERROR /
    031173     124     105     040
    031176     115     117     104
    031201     105     115     040
    031204     105     122     122
    031207     117     122     040
    031212     000
 81                                         .EVEN
 82
 83 031214     045     101     127  FMT19:  .ASCIZ  /%AWROTE IN BSEL6: %O3%A  MODEM FORMAT IN BSEL6: %O3%N/
    031217     122     117     124
    031222     105     040     111
    031225     116     040     102
    031230     123     105     114
    031233     066     072     040
```

```
        031236     045     117     063
        031241     045     101     040
        031244     040     115     117
        031247     104     105     115
        031252     040     106     117
        031255     122     115     101
        031260     124     040     111
        031263     116     040     102
        031266     123     105     114
        031271     066     072     040
        031274     045     117     063
        031277     045     116     000
    84                                          .EVEN
    85
    86
    87
```

```
                                .SBTTL          TEST 8 - NO BUFFER ERROR

                                ;*******************************************************************
                                ;*              TEST 8 - DMR-11
                                ;*  SUBTEST 1  - TRANSMIT A BUFFER THREE TIMES WIHOUT ASSIGNING A
                                ;*               RECEIVE BUFFER.  BY ASSIGNING A NO BUFFER THRESHOLD
                                ;*               OF THREE, ENSURE THAT A NO BUFFER ERROR IS RECEIVED
                                ;*               AFTER THE THIRD THRANSMISSION.
                                ;*  SUBTEST 2  - TRANSMIT A BUFFER WITHOUT A RECEIVE BUFFER.
                                ;*               ASSIGN THE NAKS THRESHOLD OF 3 AND A NO BUFFER
                                ;*               THRESHOLD OF 7.  CHECK THAT THE NAKS ERROR COUNT IS
                                ;*               THREE AFTER SHUTDOWN.
                                ;*******************************************************************
031302                          BGNTST
031302                                                                          T8::
031302                            BGNSUB
031302                                                                          T8.1:
031302  104402                                                                          TRAP    C$BSUB
031304                                  CLEAR                   ;MACRO FOR MASTER CLEAR
                                                                ;**** MACRO EXPANSION ****
031304  004737  011066                  JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                                ;****                   ****

031310                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
031310  104410                                                                          TRAP    C$ESCAPE
031312  000416                                                                          .WORD   L10053-.
031314                                  BASEIN                  ;MACRO FOR BASE IN COMMAND
                                                                ;**** MACRO EXPANSION ****
031314  004737  011264                  JSR     PC, $BASEI      ;CALL BASE IN ROUTINE WITH DEFAULTS
031320  004000                                  .WORD   LPLU    ;SET LINE UNIT LOOP
031322  002636                                  .WORD   BASE    ;BASE TABLE ADDRESS
031324  000522                                  .WORD   DMR     ;DMR-11 MODE
                                                                ;****                   ****

031326                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
031326  104410                                                                          TRAP    C$ESCAPE
031330  000400                                                                          .WORD   L10053-.
031332                                  CNTRIN  MAINT           ;MACRO FOR CONTROL IN (FULL DUPLEX AND MAINT)
                                                                ;**** MACRO EXPANSION ****
031332  004737  011520                  JSR     PC, $CNTIN      ;CALL CONTROL IN ROUTINE
031336  000400                                  .WORD   MAINT   ;SEL6 - (DUPLEX, MODE)
                                                                ;****                   ****

031340                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
031340  104410                                                                          TRAP    C$ESCAPE
031342  000366                                                                          .WORD   L10053-.

                                                                ;SET THRESHOLDS:
                                                                ;NAKS RCVD = 377
                                                                ;NAKS SENT = 377
                                                                ;REP SENT = 377
                                                                ;NO BUFFER = 3
031344                                  DMRIN   THRESH,177777,1777
                                                                ;**** MACRO EXPANSION ****
031344  004737  012060                  JSR     PC, $DMRIN      ;CALL DMR MODE INPUT ROUTINE
031350  000013                                  .WORD   THRESH  ;INPUT COMMAND
031352  177777                                  .WORD   177777  ;SEL4 VALUE (OR BITS TO CLEAR IN BSEL6)
```

```
     031354  001777                                  .WORD   1777    ;SEL6 VALUE (OR BITS TO SET IN BSEL6)
                                                                     ;****                   ****
  32
  33 031356                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
     031356  104410                                                                          TRAP    C$ESCAPE
     031360  000350                                                                          .WORD   L10053-.
  34 031362  012700  000003                  MOV     #3,R0           ;SET UP A COUNTER
  35 031366                          1$:
  36 031366                                  BACCIT                  ;BA/CC IN COMMAND FOR TRANSMIT
                                                                     ;**** MACRO EXPANSION ****
     031366  004737  012270                  JSR     PC, $BACC       ;CALL BA/CC IN ROUTINE WITH DEFAULTS
     031372  000040                                  .WORD   RQI!BACCT       ;BA/CC IN TRANSMIT COMMAND
     031374  002520                                  .WORD   TBUF    ;TRANSMIT BUFFER ADDRESS
     031376  000044                                  .WORD   TCOUNT  ;TRANSMIT CHARACTER COUNT
                                                                     ;****                   ****
  37
  38 031400                                  WAIT    RDO             ;WAIT FOR RDO TO BE SET
                                                                     ;**** MACRO EXPANSION ****
     031400  004737  010274                  JSR     PC, $WAIT       ;CALL WAIT ROUTINE
     031404  000001                                  .WORD   1       ;FLAG THAT WE'RE WAITING FOR RDO
                                                                     ;****                   ****
  39 031406                                  ESCAPE  TST             ;IF RDO NOT SET, BR TO TEST END.
     031406  104410                                                                          TRAP    C$ESCAPE
     031410  000320                                                                          .WORD   L10053-
  40 031412  005300                          DEC     R0              ;DEC COUNTER
  41 031414  001404                          BEQ     10$             ;TRANSMIT FOR 3 TIMES.
  42 031416  042777  000207  150610          BIC     #RDO.CMD,@SEL2  ;CLEAR BACC OUT TRANSMIT.
  43 031424  000760                          BR      1$              ;TRANSMIT AGAIN
  44 031426                          10$:
  45 031426  032777  000001  150600          BIT     #CNTRL,@SEL2    ;IS THIS A CONTROL OUT?
  46 031434  001005                          BNE     20$             ;IF YES, PROCEED.
  47 031436                                  ERRDF   8,EMG8,ERRG2    ;EXPECTED CONTROL OUT NOT RECEIVED.
     031436  104455                                                                          TRAP    C$ERDF
     031440  000010                                                                          .WORD   8
     031442  017762                                                                          .WORD   EMG8
     031444  015112                                                                          .WORD   ERRG2
  48 031446  000410                          BR      30$             ;EXIT
  49 031450                          20$:
  50 031450  032777  000004  150562          BIT     #NOBFR,@SEL6    ;IS THE NO BUFFER FLAG SET?
  51 031456  001004                          BNE     30$             ;IF YES - OK, PROCEED.
  52 031460                                  ERRDF   9,EMG9,ERRG2    ;WE'RE NOT GETTING EXPECTED RESULT
     031460  104455                                                                          TRAP    C$ERDF
     031462  000011                                                                          .WORD   9
     031464  020026                                                                          .WORD   EMG9
     031466  015112                                                                          .WORD   ERRG2
  53                                                                 ;(EITHER CONTROL OUT OR NOBUF/NAKS)
  54 031470                          30$:
  55 031470  042777  000207  150536          BIC     #RDO!CMD,@SEL2  ;CLEAR CONTROL OUT
  56 031476                                  WAIT    RDO             ;EXPECT ANOTHER BACC OUT.
                                                                     ;**** MACRO EXPANSION ****
     031476  004737  010274                  JSR     PC, $WAIT       ;CALL WAIT ROUTINE
     031502  000001                                  .WORD   1       ;FLAG THAT WE'RE WAITING FOR RDO
                                                                     ;****                   ****
  57 031504                                  ESCAPE  TST             ;IF ERROR, BR TO END.
     031504  104410                                                                          TRAP    C$ESCAPE
     031506  000222                                                                          .WORD   L10053-.
  58 031510  042777  000207  150516          BIC     #RDO CMD,@SEL2  ;CLEAR BACC OUT.
```

```
 59 031516                                  SHUTDN                  ;HALT DMR
                                                                    ;**** MACRO EXPANSION ****
    031516  004737  012550                  JSR     PC, $HALT       ;DMR HALT ROUTINE.
                                                                    ;****                   ****
 60 031522                            50$:
 61 031522                              ENDSUB
    031522                                                                          L10054:
    031522  104403                                                                          TRAP    C$ESUB
 62
 63 031524                              BGNSUB
    031524                                                                          T8.2:
    031524  104402                                                                          TRAP    C$BSUB
 64 031526                                  CLEAR                   ;MACRO FOR MASTER CLEAR
                                                                    ;**** MACRO EXPANSION ****
    031526  004737  011066                  JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                                    ;****                   ****
 65
 66 031532                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
    031532  104410                                                                          TRAP    C$ESCAPE
    031534  000174                                                                          .WORD   L10053-.
 67 031536                                  BASEIN                  ;MACRO FOR BASE IN COMMAND
                                                                    ;**** MACRO EXPANSION ****
    031536  004737  011264                  JSR     PC, $BASEI      ;CALL BASE IN ROUTINE WITH DEFAULTS
    031542  004000                                  .WORD   LPLU    ;SET LINE UNIT LOOP
    031544  002636                                  .WORD   BASE    ;BASE TABLE ADDRESS
    031546  000522                                  .WORD   DMR     ;DMR-11 MODE
                                                                    ;****                   ****
 68
 69 031550                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
    031550  104410                                                                          TRAP    C$ESCAPE
    031552  000156                                                                          .WORD   L10053-.
 70 031554                                  CNTRIN                  ;MACRO FOR CONTROL IN (FULL DUPLEX)
                                                                    ;**** MACRO EXPANSION ****
    031554  004737  011520                  JSR     PC, $CNTIN      ;CALL CONTROL IN ROUTINE WITH DEFAULT
    031560  000000                                  .WORD   0       ;SEL6 - FULL DUPLEX, RUN MODE, 1 SEC START.
                                                                    ;****                   ****
 71
 72 031562                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
    031562  104410                                                                          TRAP    C$ESCAPE
    031564  000144                                                                          .WORD   L10053-.
 73
 74                                                                 ;SET THRESHOLDS:
 75                                                                 ;NAKS RCVD = 3
 76                                                                 ;NAKS SENT = 3
 77                                                                 ;REP SENT = 377
 78                                                                 ;NO BUFFER = 7
 79 031566                                  DMRIN   THRESH,1403,3777
                                                                    ;**** MACRO EXPANSION ****
    031566  004737  012060                  JSR     PC, $DMRIN      ;CALL DMR MODE INPUT ROUTINE
    031572  000013                                  .WORD   THRESH  ;INPUT COMMAND
    031574  001403                                  .WORD   1403    ;SEL4 VALUE (OR BITS TO CLEAR IN BSEL6)
    031576  003777                                  .WORD   3777    ;SEL6 VALUE (OR BITS TO SET IN BSEL6)
                                                                    ;****                   ****
 80
 81 031600                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
    031600  104410                                                                          TRAP    C$ESCAPE
    031602  000126                                                                          .WORD   L10053-.
```

```
 82 031604                                  BACCIT                      ;BA/CC IN COMMAND FOR TRANSMIT
                                                                        ;**** MACRO EXPANSION ****
    031604  004737  012270                  JSR     PC, $BACC           ;CALL BA/CC IN ROUTINE WITH DEFAULTS
    031610  000040                                  .WORD   RQI!BACCT           ;BA/CC IN TRANSMIT COMMAND
    031612  002520                                  .WORD   TBUF        ;TRANSMIT BUFFER ADDRESS
    031614  000044                                  .WORD   TCOUNT      ;TRANSMIT CHARACTER COUNT
                                                                        ;****                   ****
 83 031616                              10$:
 84 031616                                  WAIT    RDO                 ;WAIT FOR RDO TO BE SET
                                                                        ;**** MACRO EXPANSION ****
    031616  004737  010274                  JSR     PC, $WAIT           ;CALL WAIT ROUTINE
    031622  000001                                  .WORD   1           ;FLAG THAT WE'RE WAITING FOR RDO
                                                                        ;****                   ****
 85 031624                                  ESCAPE  TST                 ;IF RDO NOT SET, BR TO TEST END.
    031624  104410                                                                          TRAP    C$ESCAPE
    031626  000102                                                                          .WORD   L10053-.
 86 031630  032777  000001  150376          BIT     #CNTRL,@SEL2        ;IS THIS A CONTROL OUT?
 87 031636  001005                          BNE     20$                 ;IF YES, PROCEED.
 88 031640                                  ERRDF   8,EMG8,E RG2        ;EXPECTED CONTROL OUT NOT RECEIVED.
    031640  104455                                                                          TRAP    C$ERDF
    031642  000010                                                                          .WORD   8
    031644  017762                                                                          .WORD   EMG8
    031646  015112                                                                          .WORD   ERRG2
 89 031650  000410                          BR      30$                 ;EXIT
 90 031652                              20$:
 91 031652  032777  000004  150360          BIT     #NOBFR,@SEL6        ;IS THE NO BUFFER FLAG SET?
 92 031660  001004                          BNE     30$                 ;IF YES - OK, PROCEED.
 93 031662                                  ERRDF   9,EMG9,ERRG2        ;WE'RE NOT GETTING EXPECTED RESULT
    031662  104455                                                                          TRAP    C$ERDF
    031664  000011                                                                          .WORD   9
    031666  020026                                                                          .WORD   EMG9
    031670  015112                                                                          .WORD   ERRG2
 94                                                                     ;(EITHER CONTROL OUT OR NOBUF/NAKS)
 95 031672                              30$:
 96 031672                                  SHUTDN
                                                                        ;**** MACRO EXPANSION ****
    031672  004737  012550                  JSR     PC, $HALT           ;DMR HALT ROUTINE.
                                                                        ;****                   ****
 97 031676  123727  002641  000003          CMPB    BASE+3,#3           ;NAKS REC. - NO BUFFER = 3?
 98 031704  001004                          BNE     35$                 ;IF NOT ERROR
 99 031706  123727  002644  000003          CMPB    BASE+6,#3           ;NAKS SENT - NO BUFFER = 3?
100 031714  001404                          BEQ     40$                 ;IF OK - SKIP.
101 031716                              35$:
102 031716                                  ERRDF   23,EMT20,ERRT4
    031716  104455                                                                          TRAP    C$ERDF
    031720  000027                                                                          .WORD   23
    031722  031770                                                                          .WORD   EMT20
    031724  031732                                                                          .WORD   ERRT4
103
104 031726                              40$:
105 031726                                ENDSUB
    031726                                                                          L10055:
    031726  104403                                                                          TRAP    C$ESUB
106 031730                              ENDTST
    031730                                                                          L10053:
    031730  104401                                                                          TRAP    C$ETST
107
```

```
    108
    109 031732                          BGNMSG  ERRT4                                          ERRT4::
        031732                                                                                          CLR     -(SP)
    110 031732                                  PRINTB  #FMG7,<B,BASE+3>,<B,BASE+6>                     BISB    BASE+6,(SP)
        031732  005046                                                                                  CLR     -(SP)
        031734  153716  002644                                                                          BISB    BASE+3,(SP)
        031740  005046                                                                                  MOV     #FMG7,-(SP)
        031742  153716  002641                                                                          MOV     #3,-(SP)
        031746  012746  016510                                                                          MOV     SP,R0
        031752  012746  000003                                                                          TRAP    C$PNTB
        031756  010600                                                                                  ADD     #10,SP
        031760  104414
        031762  062706  000010
    111 031766                          ENDMSG
        031766                                                                                  L10056:
        031766  104423                                                                                  TRAP    C$MSG
    112
    113 031770     116     101     113  EMT20:  .ASCIZ  /NAKS ERROR/
        031773     123     040     105
        031776     122     122     117
        032001     122     000
    114                                         .EVEN
    115
```

```
                                .SBTTL          TEST 9 - NON-EXISTENT MEMORY ERROR

                                ;*******************************************************************
                                ;*              TEST 9 - DMR-11
                                ;* NON-EXISTENT MEMORY (NXM) ERROR CHECK
                                ;* PERFORM DMR COMMANDS USING NXM ADDRESSES; VERIFY THAT NXM ERROR IS
                                ;* REPORTED IN EACH OF THE FOLLOWING SUBTESTS:
                                ;*  SUBTEST 1  -  BASE IN RESUME COMMAND - BASE TABLE ADDRESS IS NXM
                                ;*  SUBTEST 2  -  BA/CC IN RECEIVE COMMAND - BA/CC IN ADDRESS IS NXM
                                ;*  SUBTEST 3  -  BA/CC IN TRANSMIT COMMAND - BA/CC IN ADDRESS IS NXM
                                ;*
                                ;*******************************************************************
032004                          BGNTST
032004                                                                          T9::
032004                            BGNSUB
032004                                                                          T9.1:
032004  104402                                                                          TRAP    C$BSUB
032006                                  CLEAR                   ;MASTER CLEAR MACRO
                                                                ;**** MACRO EXPANSION ****
032006  004737  011066                  JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                                ;****                   ****

032012                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END
032012  104410                                                                          TRAP    C$ESCAPE
032014  000500                                                                          .WORD   L10057-.
032016                                  BASEIN                  ;BASE IN COMMAND - DMR MODE
                                                                ;**** MACRO EXPANSION ****
032016  004737  011264                  JSR     PC, $BASEI      ;CALL BASE IN ROUTINE WITH DEFAULTS
032022  004000                                  .WORD   LPLU    ;SET LINE UNIT LOOP
032024  002636                                  .WORD   BASE    ;BASE TABLE ADDRESS
032026  000522                                  .WORD   DMR     ;DMR-11 MODE
                                                                ;****                   ****

032030                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END
032030  104410                                                                          TRAP    C$ESCAPE
032032  000462                                                                          .WORD   L10057-.
032034                                  SHUTDN                  ;HALT
                                                                ;**** MACRO EXPANSION ****
032034  004737  012550                  JSR     PC, $HALT       ;DMR HALT ROUTINE.
                                                                ;****                   ****
032040                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
032040  104410                                                                          TRAP    C$ESCAPE
032042  000452                                                                          .WORD   L10057-.
032044  012737  000001  002364          MOV     #CNTRL,ERROR    ;THIS FLAG WILL INHIBIT CONTROL OUT
                                                                ;ERROR REPORTING - BECAUSE WE EXPECT ONE.


                                                                ;BASE IN RESUME COMMAND WITH NXM BASE TABLE.
032052                                  BASEIN  0,160000,BIT15!BIT14!RES!DMR
                                                                ;**** MACRO EXPANSION ****
032052  004737  011264                  JSR     PC, $BASEI      ;CALL BASE IN ROUTINE
032056  000000                                  .WORD   0       ;MAINTENANCE MODE BITS TO SET IN BSEL1
032060  160000                                  .WORD   160000  ;BASE TABLE ADDRESS
032062  150522                                  .WORD   BIT15!BIT14!RES!DMR     ;MODE
                                                                ;****                   ****

032064                                  WAIT    RDO             ;WAIT FOR RDO TO BE SET
                                                                ;**** MACRO EXPANSION ****
```

```
        032064  004737  010274                  JSR     PC, $WAIT       ;CALL WAIT ROUTINE
        032070  000001                          .WORD   1               ;FLAG THAT WE'RE WAITING FOR RDO
                                                                        ;****                   ****
     30 032072  032777  000001  150134          BIT     #CNTRL,@SEL2    ;IS THERE A CONTROL OUT REPORTED ?
     31 032100  001005                          BNE     10$             ;IF YES, PROCEED.
     32 032102                                  ERRDF   8,EMG8,ERRG2    ;EXPECTED CONTROL OUT
        032102  104455                                                                          TRAP    C$ERDF
        032104  000010                                                                          .WORD   8
        032106  017762                                                                          .WORD   EMG8
        032110  015112                                                                          .WORD   ERRG2
     33 032112  000410                          BR      20$             ;EXIT
     34 032114                          10$:
     35 032114  032777  000400  150116          BIT     #NXM,@SEL6      ;IS THE NXM FLAG SET?
     36 032122  001004                          BNE     20$             ;IF YES - ERROR REPORTED CORRECTLY
     37 032124                                  ERRDF   9,EMG9,ERRG2    ;UNEXPECTED CONTROL OUT RECEIVED
        032124  104455                                                                          TRAP    C$ERDF
        032126  000011                                                                          .WORD   9
        032130  020026                                                                          .WORD   EMG9
        032132  015112                                                                          .WORD   ERRG2
     38 032134                          20$:
     39 032134  042777  000207  150072          BIC     #RDO!CMD,@SEL2  ;CLEAR RDO AND THE COMMAND BITS
     40 032142  005037  002364                  CLR     ERROR           ;ALLOW ERROR REPORTING
     41 032146                          ENDSUB
        032146                                                                          L10060:
        032146  104403                                                                          TRAP    C$ESUB
     42
     43 032150                          BGNSUB
        032150                                                                          T9.2:
        032150  104402                                                                          TRAP    C$BSUB
     44 032152                          CLEAR                           ;MACRO FOR MASTER CLEAR
                                                                        ;**** MACRO EXPANSION ****
        032152  004737  011066                  JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                                        ;****                   ****
     45
     46 032156                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
        032156  104410                                                                          TRAP    C$ESCAPE
        032160  000334                                                                          .WORD   L10057-.
     47 032162                                  BASEIN                  ;MACRO FOR BASE IN COMMAND
                                                                        ;**** MACRO EXPANSION ****
        032162  004737  011264                  JSR     PC, $BASEI      ;CALL BASE IN ROUTINE WITH DEFAULTS
        032166  004000                                  .WORD   LPLU    ;SET LINE UNIT LOOP
        032170  002636                                  .WORD   BASE    ;BASE TABLE ADDRESS
        032172  000522                                  .WORD   DMR     ;DMR-11 MODE
                                                                        ;****                   ****
     48
     49 032174                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
        032174  104410                                                                          TRAP    C$ESCAPE
        032176  000316                                                                          .WORD   L10057-.
     50 032200                                  CNTRIN                  ;MACRO FOR CONTROL IN (FULL DUPLEX)
                                                                        ;**** MACRO EXPANSION ****
        032200  004737  011520                  JSR     PC, $CNTIN      ;CALL CONTROL IN ROUTINE WITH DEFAULT
        032204  000000                                  .WORD   0       ;SEL6 - FULL DUPLEX, RUN MODE, 1 SEC START.
                                                                        ;****                   ****
     51
     52 032206                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
        032206  104410                                                                          TRAP    C$ESCAPE
        032210  000304                                                                          .WORD   L10057-.
```

```
 53 032212  012737  000001  002364          MOV     #CNTRL,ERROR     ;INHIBIT CONTROL OUT ERROR REPORTING AGAIN.
 54
 55                                                                  ;BA/CC IN REC. COMMAND WITH NXM
 56                                                                  ;ADDR = 760000 AND A CHARACTER COUNT = 3.
 57 032220                                  BACCIR  160000,BIT15!BIT14!RCOUNT
                                                                     ;**** MACRO EXPANSION ****
    032220  004737  012270                  JSR     PC, $BACC        ;CALL BA/CC IN ROUTINE
    032224  000044                                  .WORD   RQI!BACCR        ;BA/CC IN RECEIVE COMMAND
    032226  160000                                  .WORD   160000   ;BUFFER ADDRESS BITS 0-15
    032230  140044                                  .WORD   BIT15!BIT14!RCOUNT       ;BA BITS 16/17 AND CHAR. COUNT
                                                                     ;****                    ****
 58
 59 032232                                  BACCIT                   ;BA/CC IN XMIT
                                                                     ;**** MACRO EXPANSION ****
    032232  004737  012270                  JSR     PC, $BACC        ;CALL BA/CC IN ROUTINE WITH DEFAULTS
    032236  000040                                  .WORD   RQI!BACCT        ;BA/CC IN TRANSMIT COMMAND
    032240  002520                                  .WORD   TBUF     ;TRANSMIT BUFFER ADDRESS
    032242  000044                                  .WORD   TCOUNT   ;TRANSMIT CHARACTER COUNT
                                                                     ;****                    ****
 60
 61 032244                                  WAIT    RDO              ;WAIT FOR RDO
                                                                     ;**** MACRO EXPANSION ****
    032244  004737  010274                  JSR     PC, $WAIT        ;CALL WAIT ROUTINE
    032250  000001                                  .WORD   1        ;FLAG THAT WE'RE WAITING FOR RDO
                                                                     ;****                    ****
 62 032252  032777  000001  147754          BIT     #CNTRL,@SEL2     ;IS THERE A CONTROL OUT REPORTED ?
 63 032260  001005                          BNE     10$              ;IF YES, PROCEED.
 64 032262                                  ERRDF   8,EMG8,ERRG2     ;EXPECTED CONTROL OUT
    032262  104455                                                                          TRAP    C$ERDF
    032264  000010                                                                          .WORD   8
    032266  017762                                                                          .WORD   EMG8
    032270  015112                                                                          .WORD   ERRG2
 65 032272  000410                          BR      20$              ;EXIT
 66 032274                          10$:
 67 032274  032777  000400  147736          BIT     #NXM,@SEL6       ;IS THE NXM FLAG SET?
 68 032302  001004                          BNE     20$              ;IF YES - ERROR REPORTED CORRECTLY
 69 032304                                  ERRDF   9,EMG9,ERRG2     ;UNEXPECTED CONTROL OUT RECEIVED
    032304  104455                                                                          TRAP    C$ERDF
    032306  000011                                                                          .WORD   9
    032310  020026                                                                          .WORD   EMG9
    032312  015112                                                                          .WORD   ERRG2
 70
 71 032314                          20$:
 72 032314  042777  000207  147712          BIC     #RDO!CMD,@SEL2   ;CLEAR RDO AND THE COMMAND BITS.
 73 032322  005037  002364                  CLR     ERROR            ;ENABLE ERROR REPORTING
 74 032326                          ENDSUB
    032326                                                                                  L10061:
    032326  104403                                                                          TRAP    C$ESUB
 75
 76 032330                          BGNSUB
    032330                                                                                  T9.3:
    032330  104402                                                                          TRAP    C$BSUB
 77 032332                                  CLEAR                    ;MACRO FOR MASTER CLEAR
                                                                     ;**** MACRO EXPANSION ****
    032332  004737  011066                  JSR     PC, $MSCLR       ;ISSUE A DMR MASTER CLEAR
                                                                     ;****                    ****
 78
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```
 79 032336                                  ESCAPE  TST                 ;IF ERROR, BR TO TEST END.
    032336  104410                                                                                  TRAP    C$ESCAPE
    032340  000154                                                                                  .WORD   L10057-.
 80 032342                                  BASEIN                      ;MACRO FOR BASE IN COMMAND
                                                                        ;**** MACRO EXPANSION ****
    032342  004737  011264                  JSR     PC, $BASEI          ;CALL BASE IN ROUTINE WITH DEFAULTS
    032346  004000                                  .WORD   LPLU        ;SET LINE UNIT LOOP
    032350  002636                                  .WORD   BASE        ;BASE TABLE ADDRESS
    032352  000522                                  .WORD   DMR         ;DMR-11 MODE
                                                                        ;****                   ****
 81
 82 032354                                  ESCAPE  TST                 ;IF ERROR, BR TO TEST END.
    032354  104410                                                                                  TRAP    C$ESCAPE
    032356  000136                                                                                  .WORD   L10057-.
 83 032360                                  CNTRIN                      ;MACRO FOR CONTROL IN (FULL DUPLEX)
                                                                        ;**** MACRO EXPANSION ****
    032360  004737  011520                  JSR     PC, $CNTIN          ;CALL CONTROL IN ROUTINE WITH DEFAULT
    032364  000000                                  .WORD   0           ;SEL6 - FULL DUPLEX, RUN MODE, 1 SEC START.
                                                                        ;****                   ****
 84
 85 032366                                  ESCAPE  TST                 ;IF ERROR, BR TO TEST END.
    032366  104410                                                                                  TRAP    C$ESCAPE
    032370  000124                                                                                  .WORD   L10057-.
 86 032372                                  BACCIR                      ;BA/CC IN RCV
                                                                        ;**** MACRO EXPANSION ****
    032372  004737  012270                  JSR     PC, $BACC           ;CALL BA/CC IN ROUTINE WITH DEFAULTS
    032376  000044                                  .WORD   RQI!BACCR           ;BA/CC IN RECEIVE COMMAND
    032400  002570                                  .WORD   RBUF        ;RECEIVE BUFFER
    032402  000044                                  .WORD   RCOUNT      ;RECEIVE CHARACTER COUNT
                                                                        ;****                   ****
 87
 88 032404                                  ESCAPE  TST                 ;IF ERROR, BR TO TEST END.
    032404  104410                                                                                  TRAP    C$ESCAPE
    032406  000106                                                                                  .WORD   L10057-.
 89 032410  012737  000001  002364          MOV     #CNTRL,ERROR        ;INHIBIT CONTROL OUT ERROR REPORTING AGAIN.
 90
 91                                                                     ;BA/CC IN XMIT COMMAND WITH NXM BUFFER
 92                                                                     ;ADDRESS (760000) AND A CHAR. COUNT = 1
 93 032416                                  BACCIT  160000,BIT15!BIT14!1
                                                                        ;**** MACRO EXPANSION ****
    032416  004737  012270                  JSR     PC, $BACC           ;CALL BA/CC IN ROUTINE
    032422  000040                                  .WORD   RQI!BACCT           ;BA/CC IN TRANSMIT COMMAND
    032424  160000                                  .WORD   160000      ;BUFFER ADDRESS BITS 0-15
    032426  140001                                  .WORD   BIT15!BIT14!1       ;BA BITS 16 & 17 AND CHAR. COUNT
                                                                        ;****                   ****
 94
 95 032430                                  WAIT    RDO                 ;WAIT FOR RDO TO BE SET.
                                                                        ;**** MACRO EXPANSION ****
    032430  004737  010274                  JSR     PC, $WAIT           ;CALL WAIT ROUTINE
    032434  000001                                  .WORD   1           ;FLAG THAT WE'RE WAITING FOR RDO
                                                                        ;****                   ****
 96 032436  032777  000001  147570          BIT     #CNTRL,@SEL2        ;IS THERE A CONTROL OUT REPORTED ?
 97 032444  001005                          BNE     10$                 ;IF YES, PROCEED.
 98 032446                                  ERRDF   8,EMG8,ERRG2        ;EXPECTED CONTROL OUT
    032446  104455                                                                                  TRAP    C$ERDF
    032450  000010                                                                                  .WORD   8
    032452  017762                                                                                  .WORD   EMG8
```

```
        032454  015112                                                                    .WORD   ERRG2
     99 032456  000410                          BR      20$             ;EXIT
    100 032460                          10$:
    101 032460  032777  000400  147552          BIT     #NXM,@SEL6      ;IS THE NXM FLAG SET?
    102 032466  001004                          BNE     20$             ;IF YES - ERROR REPORTED CORRECTLY
    103 03247C                                  ERRDF   9,EMG9,ERRG2    ;UNEXPECTED CONTROL OUT RECEIVED
        032470  104455                                                                    TRAP    C$ERDF
        032472  000011                                                                    .WORD   9
        032474  020026                                                                    .WORD   EMG9
        032476  015112                                                                    .WORD   ERRG2
    104 032500                          20$:
    105 032500  042777  000207  147526          BIC     #RDO!CMD,@SEL2  ;CLEAR RDO AND THE COMMAND BITS.
    106 032506  005037  002364                  CLR     ERROR           ;DON'T INHIBIT CONTROL OUT ERRORS
    107 032512                            ENDSUB
        032512                                                                    L10062:
        032512  104403                                                                    TRAP    C$ESUB
    108
    109 032514                          ENDTST
        032514                                                                    L10057:
        032514  104401                                                                    TRAP    C$ETST
    110
    111
    112
    113
    114
    115
```

```
                                .SBTTL          TEST 10 - TIME OUT ERROR

                                ;*******************************************************************
                                ;*              TEST  10 - DMR-11
                                ;* TIME OUT - FORCE A TIMEOUT AND VERIFY THAT THE ERROR IS REPORTED
                                ;* THIS TEST WILL ALSO USE AN APPROXIMATE TIMER TO DETERMINE IF THE
                                ;* M8207 1 MSEC PROGRAM TIMER IS OUT OF RANGE.
                                ;*
                                ;*******************************************************************
032516                          BGNTST
032516                                                                          T10::
032516                                  CLEAR                   ;MACRO FOR MASTER CLEAR
                                                                ;**** MACRO EXPANSION ****
032516  004737  011066                  JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                                ;****                   ****

032522                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
032522  104410                                                                          TRAP    C$ESCAPE
032524  000214                                                                          .WORD   L10063-.
032526                                  BASEIN                  ;MACRO FOR BASE IN COMMAND
                                                                ;**** MACRO EXPANSION ****
032526  004737  011264                  JSR     PC, $BASEI      ;CALL BASE IN ROUTINE WITH DEFAULTS
032532  004000                                  .WORD   LPLU    ;SET LINE UNIT LOOP
032534  002636                                  .WORD   BASE    ;BASE TABLE ADDRESS
032536  000522                                  .WORD   DMR     ;DMR-11 MODE
                                                                ;****                   ****

                                                                ;SET THRESHOLD VALUES AS FOLLOWS:
                                                                ;BSEL4 = NAKS RECEIVED (377)
                                                                ;BSEL5 = NAKS TRANSMITTED (377)
                                                                ;BSEL6 = REP/SEL SENT (1)
                                                                ;BSEL7 = NO BUFFFER (377)
032540                                  DMRIN   THRESH,177777,177401
                                                                ;**** MACRO EXPANSION ****
032540  004737  012060                  JSR     PC, $DMRIN      ;CALL DMR MODE INPUT ROUTINE
032544  000013                                  .WORD   THRESH  ;INPUT COMMAND
032546  177777                                  .WORD   177777  ;SEL4 VALUE (OR BITS TO CLEAR IN BSEL6)
032550  177401                                  .WORD   177401  ;SEL6 VALUE (OR BITS TO SET IN BSEL6)
                                                                ;****                   ****

032552                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END
032552  104410                                                                          TRAP    C$ESCAPE
032554  000164                                                                          .WORD   L10063-.
032556                                  DMRIN   TIMER,0,10      ;SET REP/SEL TIMER
                                                                ;**** MACRO EXPANSION ****
032556  004737  012060                  JSR     PC, $DMRIN      ;CALL DMR MODE INPUT ROUTINE
032562  000012                                  .WORD   TIMER   ;INPUT COMMAND
032564  000000                                  .WORD   0       ;SEL4 VALUE (OR BITS TO CLEAR IN BSEL6)
032566  000010                                  .WORD   10      ;SEL6 VALUE (OR BITS TO SET IN BSEL6)
                                                                ;****                   ****

032570                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
032570  104410                                                                          TRAP    C$ESCAPE
032572  000146                                                                          .WORD   L10063-.
032574                                  CNTRIN                  ;MACRO FOR CONTROL IN (FULL DUPLEX)
                                                                ;**** MACRO EXPANSION ****
032574  004737  011520                  JSR     PC, $CNTIN      ;CALL CONTROL IN ROUTINE WITH DEFAULT
```

```
        032600  000000                                  .WORD   0       ;SEL6 - FULL DUPLEX, RUN MODE, 1 SEC START.
                                                                        ;****                   ****
     28
     29 032602                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
        032602  104410                                                                          TRAP    C$ESCAPE
        032604  000134                                                                          .WORD   L10063-.
     30
     31                                                                 ;BLIND THE RECEIVER BY GOING INTO HDX.
     32 032606                                  DMRIN   WMODEM,0,BIT4   ;USE A MODE COMMAND TO SET HALF DUPLEX.
                                                                        ;**** MACRO EXPANSION ****
        032606  004737  012060                  JSR     PC, $DMRIN      ;CALL DMR MODE INPUT ROUTINE
        032612  000005                                  .WORD   WMODEM  ;INPUT COMMAND
        032614  000000                                  .WORD   0       ;SEL4 VALUE (OR BITS TO CLEAR IN BSEL6)
        032616  000020                                  .WORD   BIT4    ;SEL6 VALUE (OR BITS TO SET IN BSEL6)
                                                                        ;****                   ****
     33
     34 032620                                  BACCIT                  ;BA/CC IN XMIT BUFFER
                                                                        ;**** MACRO EXPANSION ****
        032620  004737  012270                  JSR     PC, $BACC       ;CALL BA/CC IN ROUTINE WITH DEFAULTS
        032624  000040                                  .WORD   RQI!BACCT       ;BA/CC IN TRANSMIT COMMAND
        032626  002520                                  .WORD   TBUF    ;TRANSMIT BUFFER ADDRESS
        032630  000044                                  .WORD   TCOUNT  ;TRANSMIT CHARACTER COUNT
                                                                        ;****                   ****
     35
     36 032632                                  ESCAPE  TST             ;IF ERROR, EXIT
        032632  104410                                                                          TRAP    C$ESCAPE
        032634  000104                                                                          .WORD   L10063-.
     37 032636                                  WAIT    RDO             ;WAIT FOR THE READY OUT.
                                                                        ;**** MACRO EXPANSION ****
        032636  004737  010274                  JSR     PC, $WAIT       ;CALL WAIT ROUTINE
        032642  000001                                  .WORD   1       ;FLAG THAT WE'RE WAITING FOR RDO
                                                                        ;****                   ****
     38 032644                                  ESCAPE  TST             ;IF ERROR, EXIT.
        032644  104410                                                                          TRAP    C$ESCAPE
        032646  000072                                                                          .WORD   L10063-.
     39 032650  023727  002414  011610          CMP     COUNT,#5000.    ;CHECK THE SOFTWARE TIMER COUNT.
     40                                                                 ;THE TIMER VALUE WAS DETERMINED
     41                                                                 ;EMPIRICALLY ON A 11/04, 11/34, 11/40, 11/70.
     42 032656  003005                          BGT     5$              ;IF OK - PROCEED
     43                                                                 ;*************************************
     44 032660                                  ERRDF   19,EMG19        ;
        032660  104455                                                                          TRAP    C$ERDF
        032662  000023                                                                          .WORD   19
        032664  020370                                                                          .WORD   EMG19
        032666  000000                                                                          .WORD   0
     45                                                                 ;1MSEC PROGRAM TIMER - OUT OF RANGE.
     46                                                                 ;IF THIS ERROR OCCURS, CHECK THE M8207
     47                                                                 ;MICROPROCESSOR AS FOLLOWS:
     48                                                                 ;RESET THE DMR, SCOPE E-69, PIN 4 TO VERIFY
     49                                                                 ;THAT THE 1MSEC TIMER IS OUT OF RANGE.
     50                                                                 ;*************************************
     51 032670  000423                          BR      25$
     52 032672                          5$:
     53 032672  032777  000001  147334          BIT     #CNTRL,@SEL2    ;IS THIS A CONTROL OUT
     54 032700  001005                          BNE     10$             ;IF YES, PROCEED.
     55 032702                                  ERRDF   8,EMG8,ERRG2    ;EXPECTED A CONTROL OUT.
        032702  104455                                                                          TRAP    C$ERDF
```

```
        032704  000010                                                                  .WORD   8
        032706  017762                                                                  .WORD   EMG8
        032710  015112                                                                  .WORD   ERRG2
     56 032712  000410                        BR      20$             ;EXIT
     57 032714                          10$:
     58 032714  032777  000002  147316       BIT     #TOUT,@SEL6     ;WAS THE TIME OUT REPORTED?
     59 032722  001004                        BNE     20$             ;IF YES, EXIT
     60 032724                                ERRDF   9,EMG9,ERRG2    ;UNEXPECTED ERROR.
        032724  104455                                                                  TRAP    C$ERDF
        032726  000011                                                                  .WORD   9
        032730  020026                                                                  .WORD   EMG9
        032732  015112                                                                  .WORD   ERRG2
     61 032734                          20$:
     62 032734                                SHUTDN
                                                                      ;**** MACRO EXPANSION ****
        032734  004737  012550                JSR     PC, $HALT       ;DMR HALT ROUTINE.
                                                                      ;****                 ****
     63 032740                          25$:
     64
     65 032740                          ENDTST
        032740                                                                      L10063:
        032740  104401                                                                  TRAP    C$ETST
```

```
                                .SBTTL          TEST 11 - MESSAGE TOO LONG ERROR

                                ;*******************************************************************
                                ;*              TEST 11 - DMR-11
                                ;*  MESSAGE TOO LONG - TRANSMIT A MESSAGE THAT IS TOO LONG FOR THE
                                ;*  RECEIVE BUFFER  'ID VERIFY THAT THE "TOO LONG" ERROR IS RECEIVED.
                                ;*
                                ;*******************************************************************
 032742                         BGNTST
 032742                                                                          T11::
 032742                                 CLEAR                   ;MACRO FOR MASTER CLEAR
                                                                ;**** MACRO EXPANSION ****
 032742  004737  011066                 JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                                ;****                   ****

 032746                                 ESCAPE  TST             ;IF ERROR, BR TO TEST END.
 032746  104410                                                                          TRAP    C$ESCAPE
 032750  000150                                                                          .WORD   L10064-.
 032752                                 BASEIN                  ;MACRO FOR BASE IN COMMAND
                                                                ;**** MACRO EXPANSION ****
 032752  004737  011264                 JSR     PC, $BASEI      ;CALL BASE IN ROUTINE WITH DEFAULTS
 032756  004000                                 .WORD   LPLU    ;SET LINE UNIT LOOP
 032760  002636                                 .WORD   BASE    ;BASE TABLE ADDRESS
 032762  000522                                 .WORD   DMR     ;DMR-11 MODE
                                                                ;****                   ****

 032764                                 ESCAPE  TST             ;IF ERROR, BR TO TEST END.
 032764  104410                                                                          TRAP    C$ESCAPE
 032766  000132                                                                          .WORD   L10064-.
 032770                                 CNTRIN                  ;MACRO FOR CONTROL IN (FULL DUPLEX)
                                                                ;**** MACRO EXPANSION ****
 032770  004737  011520                 JSR     PC, $CNTIN      ;CALL CONTROL IN ROUTINE WITH DEFAULT
 032774  000000                                 .WORD   0       ;SEL6 - FULL DUPLEX, RUN MODE, 1 SEC START.
                                                                ;****                   ****

 032776                                 ESCAPE  TST             ;IF ERROR, BR TO TEST END.
 032776  104410                                                                          TRAP    C$ESCAPE
 033000  000120                                                                          .WORD   L10064-.
 033002                                 BACCIR  RBUF,RCOUNT/2   ;SET UP THE RECEIVE BUFFER WITH 1/2 BUF. SPACE
                                                                ;**** MACRO EXPANSION ****
 033002  004737  012270                 JSR     PC, $BACC       ;CALL BA/CC IN ROUTINE
 033006  000044                                 .WORD   RQI!BACCR       ;BA/CC IN RECEIVE COMMAND
 033010  002570                                 .WORD   RBUF    ;BUFFER ADDRESS BITS 0-15
 033012  000022                                 .WORD   RCOUNT/2        ;BA BITS 16/17 AND CHAR. COUNT
                                                                ;****                   ****

 033014  012737  000001  002364         MOV     #CNTRL,ERROR    ;THIS FLAG WILL DISABLE ANY CONTROL OUT ERROR
                                                                ;REPORTING BECAUSE WE ARE INTENTIONALLY
                                                                ;CAUSING ONE IN THIS TEST.
 033022                                 BACCIT                  ;BA/CC IN XMIT COMMAND
                                                                ;**** MACRO EXPANSION ****
 033022  004737  012270                 JSR     PC, $BACC       ;CALL BA/CC IN ROUTINE WITH DEFAULTS
 033026  000040                                 .WORD   RQI'BACCT       ;BA/CC IN TRANSMIT COMMAND
 033030  002520                                 .WORD   TBUF    ;TRANSMIT BUFFER ADDRESS
 033032  000044                                 .WORD   TCOUNT  ;TRANSMIT CHARACTER COUNT
                                                                ;****                   ****

 033034                         10$:
```

```
 26 033034                                  WAIT    RDO             ;WAIT FOR RDO TO BE SET
                                                                    ;**** MACRO EXPANSION ****
    033034  004737  010274                  JSR     PC, $WAIT       ;CALL WAIT ROUTINE
    033040  000001                                  .WORD   1       ;FLAG THAT WE'RE WAITING FOR RDO
                                                                    ;****                   ****
 27 033042                                  ESCAPE  TST             ;IF RDO NOT SET, BR TO TEST END.
    033042  104410                                                                          TRAP    C$ESCAPE
    033044  000054                                                                          .WORD   L10064-.
 28 033046  032777  000001  147160          BIT     #CNTRL,@SEL2    ;IS THIS A CONTROL OUT?
 29 033054  001005                          BNE     20$             ;IF YES, PROCEED
 30 033056                                  ERRDF   8,EMG8,ERRG2    ;EXPECTED CONTROL OUT.
    033056  104455                                                                          TRAP    C$ERDF
    033060  000010                                                                          .WORD   8
    033062  017762                                                                          .WORD   EMG8
    033064  015112                                                                          .WORD   ERRG2
 31 033066  000410                          BR      40$             ;EXIT
 32 033070                          20$:
 33 033070  032777  000020  147142          BIT     #TOLONG,@SEL6   ;IS THE TOO LONG BIT SET?
 34 033076  001004                          BNE     40$             ;IF YES, TEST OK - FINISH UP.
 35 033100                          30$:
 36 033100                                  ERRDF   9,EMG9,ERRG2    ;WE'RE NOT GETTING EXPECTED RESULT
    033100  104455                                                                          TRAP    C$ERDF
    033102  000011                                                                          .WORD   9
    033104  020026                                                                          .WORD   EMG9
    033106  015112                                                                          .WORD   ERRG2
 37
 38 033110                          40$:
 39 033110  005037  002364                  CLR     ERROR           ;RESTORE ERROR FLAG TO NORMAL STATE.
 40 033114                                  SHUTDN                  ;HALT THE DMR.
                                                                    ;**** MACRO EXPANSION ****
    033114  004737  012550                  JSR     PC, $HALT       ;DMR HALT ROUTINE.
                                                                    ;****                   ****
 41
 42
 43
 44 033120                          ENDTST
    033120                                                                  L10064:
    033120  104401                                                                          TRAP    C$ETST
 45
 46
```

```
                                .SBTTL          TEST 12 - PROCEDURE ERRORS

                                ;*******************************************************************
                                ;*              TEST 12 - DMR-11
                                ;*  PROCEDURE ERRORS -
                                ;*  THE FOLLOWING SHOULD CAUSE THE DMR-11 TO HALT AND RESPOND WITH
                                ;*  A PROCEDURE ERROR:
                                ;*  SUBTEST 1  -  A SECOND BASE IN COMMAND
                                ;*  SUBTEST 2  -  A CONTROL IN BEFORE A BASE IN
                                ;*  SUBTEST 3  -  A BA/CC IN BEFORE A BASE IN
                                ;*  SUBTEST 4  -  A BA/CC IN RCV WITH A BUFFER LENGTH OF 0
                                ;*  SUBTEST 5  -  A BA/CC IN XMIT. WITH A BUFFER LENGTH OF 0
                                ;*
                                ;*******************************************************************
033122                          BGNTST
033122                                                                          T12::
033122                            BGNSUB
033122                                                                          T12.1:
033122  104402                                                                          TRAP    C$BSUB

033124                                  CLEAR                   ;MASTER CLEAR MACRO
                                                                ;**** MACRO EXPANSION ****
033124  004737  011066                  JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                                ;****                   ****

033130                                  BASEIN
                                                                ;**** MACRO EXPANSION ****
033130  004737  011264                  JSR     PC, $BASEI      ;CALL BASE IN ROUTINE WITH DEFAULTS
033134  004000                                  .WORD   LPLU    ;SET LINE UNIT LOOP
033136  002636                                  .WORD   BASE    ;BASE TABLE ADDRESS
033140  000522                                  .WORD   DMR     ;DMR-11 MODE
                                                                ;****                   ****

033142  012737  000001  002364          MOV     #CNTRL,ERROR    ;THIS FLAG WILL DISABLE ANY CONTROL OUT ERROR
                                                                ;REPORTING BECAUSE WE ARE INTENTIONALLY
                                                                ;CAUSING ONE IN THIS TEST.
033150                                  BASEIN                  ;SECOND BASE IN
                                                                ;**** MACRO EXPANSION ****
033150  004737  011264                  JSR     PC, $BASEI      ;CALL BASE IN ROUTINE WITH DEFAULTS
033154  004000                                  .WORD   LPLU    ;SET LINE UNIT LOOP
033156  002636                                  .WORD   BASE    ;BASE TABLE ADDRESS
033160  000522                                  .WORD   DMR     ;DMR-11 MODE
                                                                ;****                   ****

033162                                  WAIT    RDO             ;WAIT FOR RDO TO BE SET
                                                                ;**** MACRO EXPANSION ****
033162  004737  010274                  JSR     PC, $WAIT       ;CALL WAIT ROUTINE
033166  000001                                  .WORD   1       ;FLAG THAT WE'RE WAITING FOR RDO
                                                                ;****                   ****
033170                                  ESCAPE  TST             ;IF RDO NOT SET, BR TO TEST END.
033170  104410                                                                          TRAP    C$ESCAPE
033172  000632                                                                          .WORD   L10065-.
033174  032777  000001  147032          BIT     #CNTRL,@SEL2    ;IS THIS A CONTROL OUT?
033202  001005                          BNE     10$             ;IF YES, PROCEED.
033204                                  ERRDF   8,EMG8,ERRG2    ;EXPECTED CONTROL OUT
033204  104455                                                                          TRAP    C$ERDF
033206  000010                                                                          .WORD   8
```

```
        033210  017762                                                                  .WORD   EMG8
        033212  015112                                                                  .WORD   ERRG2
     32 033214  000410                          BR      15$             ;EXIT
     33 033216                          10$:
     34 033216  032777  001000  147014          BIT     #HALTC,@SEL6    ;IS THE HALT - PROCEDURE ERROR BIT SET?
     35 033224  001004                          BNE     15$             ;IF YES - ERROR REPORTED CORRECTLY
     36 033226                                  ERRDF   9,EMG9,ERRG2    ;UNEXPECTED CONTROL OUT RECEIVED
        033226  104455                                                                  TRAP    C$ERDF
        033230  000011                                                                  .WORD   9
        033232  020026                                                                  .WORD   EMG9
        033234  015112                                                                  .WORD   ERRG2
     37 033236                          15$:
     38 033236  042777  000207  146770          BIC     #RDO CMD,@SEL2  ;CLEAR RDO AND THE COMMAND BITS
     39 033244  005037  002364                  CLR     ERROR           ;RESTORE FLAG
     40 033250                          ENDSUB
        033250                                                                          L10066:
        033250  104403                                                                  TRAP    C$ESUB
     41
     42 033252                          BGNSUB
        033252                                                                          T12.2:
        033252  104402                                                                  TRAP    C$BSUB
     43
     44 033254                                  CLEAR                   ;MASTER CLEAR MACRO
                                                                        ;**** MACRO EXPANSION ****
        033254  004737  011066                  JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                                        ;****                   ****
     45
     46 033260  012737  000001  002364          MOV     #CNTRL,ERROR    ;THIS FLAG WILL DISABLE ANY CONTROL OUT ERROR
     47                                                                 ;REPORTING BECAUSE WE ARE INTENTIONALLY
     48                                                                 ;CAUSING ONE IN THIS TEST.
     49 033266  005037  002260                  CLR     DMRFLG          ;CLEAR FLAG THAT IS SET IN BASEIN IN ORDER
     50                                                                 ;TO FLAG THAT A CONTROL OUT-DMR RUN MODE
     51                                                                 ;COMMAND IS EXPECTED (THIS FLAG WAS SET IN
     52                                                                 ;THE PREVIOUS SUBTEST BASEIN)
     53 033272                                  CNTRIN                  ;CONTROL IN
                                                                        ;**** MACRO EXPANSION ****
        033272  004737  011520                  JSR     PC, $CNTIN      ;CALL CONTROL IN ROUTINE WITH DEFAULT
        033276  000000                                  .WORD   0       ;SEL6 - FULL DUPLEX, RUN MODE, 1 SEC START.
                                                                        ;****                   ****
     54
     55 033300                                  WAIT    RDO             ;WAIT FOR RDO TO BE SET
                                                                        ;**** MACRO EXPANSION ****
        033300  004737  010274                  JSR     PC, $WAIT       ;CALL WAIT ROUTINE
        033304  000001                                  .WORD   1       ;FLAG THAT WE'RE WAITING FOR RDO
                                                                        ;****                   ****
     56 033306                                  ESCAPE  TST             ;IF RDO NOT SET, BR TO TEST END.
        033306  104410                                                                  TRAP    C$ESCAPE
        033310  000514                                                                  .WORD   L10065-.
     57 033312  032777  000001  146714          BIT     #CNTRL,@SEL2    ;IS THIS A CONTROL OUT?
     58 033320  001005                          BNE     10$             ;IF YES - PROCEED.
     59 033322                                  ERRDF   8,EMG8,ERRG2    ;EXPECTED CONTROL OUT
        033322  104455                                                                  TRAP    C$ERDF
        033324  000010                                                                  .WORD   8
        033326  017762                                                                  .WORD   EMG8
        033330  015112                                                                  .WORD   ERRG2
     60 033332  000410                          BR      15$             ;EXIT
     61 033334                          10$:
```

```
 62 033334  032777  001000  146676          BIT     #HALTC,@SEL6     ;IS THE HALT - PROCEDURE ERROR BIT SET?
 63 033342  001004                          BNE     15$              ;IF YES - ERROR REPORTED CORRECTLY
 64 033344                                  ERRDF   9,EMG9,ERRG2     ;UNEXPECTED CONTROL OUT RECEIVED
    033344  104455                                                                                  TRAP    C$ERDF
    033346  000011                                                                                  .WORD   9
    033350  020026                                                                                  .WORD   EMG9
    033352  015112                                                                                  .WORD   ERRG2
 65 033354                              15$:
 66 033354  042777  000207  146652          BIC     #PDO.CMD,@SEL2   ;CLEAR RDO AND THE COMMAND BITS.
 67 033362  005037  002364                  CLR     ERROR            ;RESTORE FLAG
 68 033366                            ENDSUB
    033366                                                                                  L10067:
    033366  104403                                                                                  TRAP    C$ESUB
 69
 70 033370                            BGNSUB
    033370                                                                                  T12.3:
    033370  104402                                                                                  TRAP    C$BSUB
 71
 72 033372                                  CLEAR                    ;MASTER CLEAR MACRO
                                                                     ;**** MACRO EXPANSION ****
    033372  004737  011066                  JSR     PC, $MSCLR       ;ISSUE A DMR MASTER CLEAR
                                                                     ;****                   ****
 73
 74 033376  012737  000001  002364          MOV     #CNTRL,ERROR     ;THIS FLAG WILL DISABLE ANY CONTROL OUT ERROR
 75                                                                  ;REPORTING BECAUSE WE ARE INTENTIONALLY
 76                                                                  ;CAUSING ONE IN THIS TEST.
 77 033404                                  BACCIR                   ;BA/CC IN RCV. COMMAND
                                                                     ;**** MACRO EXPANSION ****
    033404  004737  012270                  JSR     PC, $BACC        ;CALL BA/CC IN ROUTINE WITH DEFAULTS
    033410  000044                                  .WORD   RQI!BACCR        ;BA/CC IN RECEIVE COMMAND
    033412  002570                                  .WORD   RBUF     ;RECEIVE BUFFER
    033414  000044                                  .WORD   RCOUNT   ;RECEIVE CHARACTER COUNT
                                                                     ;****                   ****
 78
 79 033416                                  WAIT    RDO              ;WAIT FOR RDO TO BE SET
                                                                     ;**** MACRO EXPANSION ****
    033416  004737  010274                  JSR     PC, $WAIT        ;CALL WAIT ROUTINE
    033422  000001                                  .WORD   1        ;FLAG THAT WE'RE WAITING FOR RDO
                                                                     ;****                   ****
 80 033424                                  ESCAPE  TST              ;IF RDO NOT SET, BR TO TEST END.
    033424  104410                                                                                  TRAP    C$ESCAPE
    033426  000376                                                                                  .WORD   L10065-.
 81 033430  032777  000001  146576          BIT     #CNTRL,@SEL2     ;IS THIS A CONTROL OUT?
 82 033436  001005                          BNE     10$              ;IF YES - PROCEED.
 83 033440                                  ERRDF   8,EMG8,ERRG2     ;EXPECTED CONTROL OUT
    033440  104455                                                                                  TRAP    C$ERDF
    033442  000010                                                                                  .WORD   8
    033444  017762                                                                                  .WORD   EMG8
    033446  015112                                                                                  .WORD   ERRG2
 84 033450  000410                          BR      15$              ;EXIT
 85 033452                              10$:
 86 033452  032777  001000  146560          BIT     #HALTC,@SEL6     ;IS THE HALT - PROCEDURE ERROR BIT SET?
 87 033460  001004                          BNE     15$              ;IF YES - ERROR REPORTED CORRECTLY
 88 033462                                  ERRDF   9,EMG9,ERRG2     ;UNEXPECTED CONTROL OUT RECEIVED
    033462  104455                                                                                  TRAP    C$ERDF
    033464  000011                                                                                  .WORD   9
    033466  020026                                                                                  .WORD   EMG9
```

```
        033470  015112                                                                          .WORD   ERRG2
     89 033472                          15$:
     90 033472  042777  000207  146534          BIC     #RDO!CMD,@SEL2  ;CLEAR RDO AND THE COMMAND BITS.
     91 033500  005037  002364                  CLR     ERROR           ;RESTORE FLAG
     92 033504                          ENDSUB
        033504                                                                      L10070:
        033504  104403                                                                          TRAP    C$ESUB
     93
     94 033506                          BGNSUB
        033506                                                                      T12.4:
        033506  104402                                                                          TRAP    C$BSUB
     95 033510                                  CLEAR                   ;MASTER CLEAR
                                                                        ;**** MACRO EXPANSION ****
        033510  004737  011066                  JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                                        ;****                   ****
     96
     97 033514                                  ESCAPE  TST             ;IF ERROR, EXIT.
        033514  104410                                                                          TRAP    C$ESCAPE
        033516  000306                                                                          .WORD   L10065-.
     98 033520                                  BASEIN                  ;BASE IN COMMAND
                                                                        ;**** MACRO EXPANSION ****
        033520  004737  011264                  JSR     PC, $BASEI      ;CALL BASE IN ROUTINE WITH DEFAULTS
        033524  004000                                  .WORD   LPLU    ;SET LINE UNIT LOOP
        033526  002636                                  .WORD   BASE    ;BASE TABLE ADDRESS
        033530  000522                                  .WORD   DMR     ;DMR-11 MODE
                                                                        ;****                   ****
     99
    100 033532                                  ESCAPE  TST             ;IF ERROR, EXIT.
        033532  104410                                                                          TRAP    C$ESCAPE
        033534  000270                                                                          .WORD   L10065-.
    101 033536                                  BACCIR                  ;ASSIGN A BA/CC IN RECEIVE BUFFER
                                                                        ;**** MACRO EXPANSION ****
        033536  004737  012270                  JSR     PC, $BACC       ;CALL BA/CC IN ROUTINE WITH DEFAULTS
        033542  000044                                  .WORD   RQI!BACCR       ;BA/CC IN RECEIVE COMMAND
        033544  002570                                  .WORD   RBUF    ;RECEIVE BUFFER
        033546  000044                                  .WORD   RCOUNT  ;RECEIVE CHARACTER COUNT
                                                                        ;****                   ****
    102
    103 033550                                  ESCAPE  TST             ;IF ERROR, EXIT.
        033550  104410                                                                          TRAP    C$ESCAPE
        033552  000252                                                                          .WORD   L10065-.
    104 033554  012737  000001  002364          MOV     #CNTRL,ERROR    ;THIS FLAG WILL DISABLE ANY CONTROL OUT
    105                                                                 ;ERROR REPORTING BECAUSE WE ARE INTENTIONALLY
    106                                                                 ;CAUSING ONE.
    107 033562                                  BACCIT  TBUF,0          ;ASSIGN A BA/CC IN XMIT BUFFER LENGTH = 0.
                                                                        ;**** MACRO EXPANSION ****
        033562  004737  012270                  JSR     PC, $BACC       ;CALL BA/CC IN ROUTINE
        033566  000040                                  .WORD   RQI!BACCT       ;BA/CC IN TRANSMIT COMMAND
        033570  002520                                  .WORD   TBUF    ;BUFFER ADDRESS BITS 0-15
        033572  000000                                  .WORD   0       ;BA BITS 16 & 17 AND CHAR. COUNT
                                                                        ;****                   ****
    108
    109 033574                                  WAIT    RDO             ;WAIT FOR RDO TO BE SET
                                                                        ;**** MACRO EXPANSION ****
        033574  004737  010274                  JSR     PC, $WAIT       ;CALL WAIT ROUTINE
        033600  000001                                  .WORD   1       ;FLAG THAT WE'RE WAITING FOR RDO
                                                                        ;****                   ****
```

```
    110 033602                                  ESCAPE  TST             ;IF RDO NOT SET, BR TO TEST END.
        033602  104410                                                                          TRAP    C$ESCAPE
        033604  000220                                                                          .WORD   L10065-.
    111 033606  032777  000001  146420          BIT     #CNTRL,@SEL2    ;IS THIS A CONTROL OUT?
    112 033614  001005                          BNE     10$             ;IF YES - PROCEED.
    113 033616                                  ERRDF   8,EMG8,ERRG2    ;EXPECTED CONTROL OUT
        033616  104455                                                                          TRAP    C$ERDF
        033620  000010                                                                          .WORD   8
        033622  017762                                                                          .WORD   EMG8
        033624  015112                                                                          .WORD   ERRG2
    114 033626  000410                          BR      15$             ;EXIT
    115 033630                              10$:
    116 033630  032777  001000  146402          BIT     #HALTC,@SEL6    ;IS THE HALT - PROCEDURE ERROR BIT SET?
    117 033636  001004                          BNE     15$             ;IF YES - ERROR REPORTED CORRECTLY
    118 033640                                  ERRDF   9,EMG9,ERRG2    ;UNEXPECTED CONTROL OUT RECEIVED
        033640  104455                                                                          TRAP    C$ERDF
        033642  000011                                                                          .WORD   9
        033644  020026                                                                          .WORD   EMG9
        033646  015112                                                                          .WORD   ERRG2
    119 033650                              15$:
    120 033650  042777  000207  146356          BIC     #RDO!CMD,@SEL2  ;CLEAR RDO AND THE COMMAND BITS.
    121 033656  005037  002364                  CLR     ERROR           ;RESTORE FLAG
    122 033662                              ENDSUB
        033662                                                                          L10071:
        033662  104403                                                                          TRAP    C$ESUB
    123
    124 033664                              BGNSUB
        033664                                                                          T12.5:
        033664  104402                                                                          TRAP    C$BSUB
    125 033666                                  CLEAR                   ;MASTER CLEAR
                                                                        ;**** MACRO EXPANSION ****
        033666  004737  011066                  JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                                        ;****                   ****
    126
    127 033672                                  ESCAPE  TST             ;IF ERROR, EXIT.
        033672  104410                                                                          TRAP    C$ESCAPE
        033674  000130                                                                          .WORD   L10065-.
    128 033676                                  BASEIN                  ;BASE IN COMMAND
                                                                        ;**** MACRO EXPANSION ****
        033676  004737  011264                  JSR     PC, $BASEI      ;CALL BASE IN ROUTINE WITH DEFAULTS
        033702  004000                                  .WORD   LPLU    ;SET LINE UNIT LOOP
        033704  002636                                  .WORD   BASE    ;BASE TABLE ADDRESS
        033706  000522                                  .WORD   DMR     ;DMR-11 MODE
                                                                        ;****                   ****
    129
    130 033710                                  ESCAPE  TST             ;IF ERROR, EXIT.
        033710  104410                                                                          TRAP    C$ESCAPE
        033712  000112                                                                          .WORD   L10065-.
    131 033714  012737  000001  002364          MOV     #CNTRL,ERROR    ;THIS FLAG WILL DISABLE ANY CONTROL OUT
    132                                                                 ;ERROR REPORTING BECAUSE WE ARE INTENTIONALLY
    133                                                                 ;CAUSING ONE.
    134 033722                                  BACCIR  RBUF,0          ;ASSIGN A BA/CC IN REC. BUFFER LENGTH   0
                                                                        ;**** MACRO EXPANSION ****
        033722  004737  012270                  JSR     PC, $BACC       ;CALL BA/CC IN ROUTINE
        033726  000044                                  .WORD   P2: BACCR       ;BA/CC IN RECEIVE COMMAND
        033730  002570                                  .WORD   RBUF    ;BUFFER ADDRESS BITS 0-15
        033732  000000                                  .WORD   0       ;BA BITS 16/17 AND CHAR. COUNT
```

```
                                                                ;****                    ****
 135
 136 033734                                WAIT    RDO           ;WAIT FOR RDO TO BE SET
                                                                 ;**** MACRO EXPANSION ****
     033734  004737  010274                JSR     PC, $WAIT     ;CALL WAIT ROUTINE
     033740  000001                                .WORD   1     ;FLAG THAT WE'RE WAITING FOR RDO
                                                                 ;****                    ****
 137 033742                                ESCAPE  TST           ;IF RDO NOT SET, BR TO TEST END.
     033742  104410                                                                        TRAP    C$ESCAPE
     033744  000060                                                                        .WORD   L10065-.
 138 033746  032777  000001  146260        BIT     #CNTRL,@SEL2  ;IS THIS A CONTROL OUT?
 139 033754  001005                        BNE     10$           ;IF YES - PROCEED.
 140 033756                                ERRDF   8,EMG8,ERRG2  ;EXPECTED CONTROL OUT
     033756  104455                                                                        TRAP    C$ERDF
     033760  000010                                                                        .WORD   8
     033762  017762                                                                        .WORD   EMG8
     033764  015112                                                                        .WORD   ERRG2
 141 033766  000410                        BR      15$           ;EXIT
 142 033770                          10$:
 143 033770  032777  001000  146242        BIT     #HALTC,@SEL6  ;IS THE HALT - PROCEDURE ERROR BIT SET?
 144 033776  001004                        BNE     15$           ;IF YES - ERROR REPORTED CORRECTLY
 145 034000                                ERRDF   9,EMG9,ERRG2  ;UNEXPECTED CONTROL OUT RECEIVED
     034000  104455                                                                        TRAP    C$ERDF
     034002  000011                                                                        .WORD   9
     034004  020026                                                                        .WORD   EMG9
     034006  015112                                                                        .WORD   ERRG2
 146 034010                          15$:
 147 034010  042777  000207  146216        BIC     #RDO!CMD,@SEL2  ;CLEAR RDO AND THE COMMAND BITS.
 148 034016  005037  002364                CLR     ERROR           ;RESTORE FLAG
 149 034022                            ENDSUB
     034022                                                                            L10072:
     034022  104403                                                                        TRAP    C$ESUB
 150
 151 034024                          ENDTST
     034024                                                                            L10065:
     034024  104401                                                                        TRAP    C$ETST
```

```
                                .SBTTL          TEST 13 - DATA TEST

                                ;*******************************************************************
                                ;*              TEST 13 - DMR-11
                                ;* FREE RUNNING FLAG MODE DATA TEST
                                ;* TRANSMIT A MESSAGE AND VERIFY THE RECEIVED DATA IS CORRECT.
                                ;* IN THIS TEST NO INTERRUPTS ARE USED AND THE LINE UNIT IS IN
                                ;* INTERNAL (TTL) LOOPBACK.  THIS TEST IS THE FIRST TEST IN WHICH
                                ;* THE DMR IS USED IN A DATA TRANSMISSION MODE.
                                ;*******************************************************************
034026                          BGNTST
034026                                                                                  T13::
034026  013700  000044                  MOV     RCOUNT,R0       ;BYTE COUNT FOR RECEIVE BUFFER
034032  062700  000002                  ADD     #2,R0           ;2 ADDITIONAL BYTES AT END OF BUFFER ARE
                                                                ;USED FOR DELIMITOR
034036  012701  002570                  MOV     #RBUF,R1        ;ADDRESS OF RECEIVE BUFFER
034042                          10$:
034042  105021                          CLRB    (R1)+           ;CLEAR A BYTE IN THE BUFFER
034044  005300                          DEC     R0              ;CONTINUE - UNTIL ENTIRE BUFFER DONE
034046  001375                          BNE     10$

034050  005037  002516                  CLR     TFLAG           ;CLEAR TRANSMIT FLAG
034054  005037  002566                  CLR     RFLAG           ;CLEAR RECEIVER FLAG
034060                                  CLEAR                   ;MACRO FOR MASTER CLEAR
                                                                ;**** MACRO EXPANSION ****
034060  004737  011066                  JSR     PC, $MSCLR      ;ISSUF A DMR MASTER CLEAR
                                                                ;****                   ****

034064                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
034064  104410                                                                          TRAP    C$ESCAPE
034066  000466                                                                          .WORD   L10073-.
034070  005737  002254                  TST     DMTURN          ;IS INTERNAL LOOPBACK DESIRED?
034074  001004                          BNE     11$             ;IF NOT, CLEAR INTERNAL LOOPBACK.
034076  052737  004000  034120          BIS     #LPLU,100$      ;SET LINE UNIT LOOPBACK.
034104  000403                          BR      12$
034106                          11$:
034106  042737  004000  034120          BIC     #LPLU,100$      ;CLEAR LINE UNIT LOOPBACK.
034114                          12$:
034114                                  CALL    $BASEI          ;BASE IN COMMAND.
034120  000000                  100$:           .WORD   0       ;MAINTENANCE BITS (LINE UNIT LOOP)
034122  002636                                  .WORD   BASE    ;BASE TABLE ADDRESS
034124  000522                                  .WORD   DMR     ;DMR MODE
034126                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
034126  104410                                                                          TRAP    C$ESCAPE
034130  000424                                                                          .WORD   L10073-.

034132                                  CALL    $LOOP           ;DMR COMMAND TO SET MAINT. BITS
034136                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
034136  104410                                                                          TRAP    C$ESCAPE
034140  000414                                                                          .WORD   L10073-.

034142                                  CNTRIN                  ;MACRO FOR CONTROL IN (FULL DUPLEX)
                                                                ;**** MACRO EXPANSION ****
034142  004737  011520                  JSR     PC, $CNTIN      ;CALL CONTROL IN ROUTINE WITH DEFAULT
034146  000000                                  .WORD   0       ;SEL6 - FULL DUPLEX, RUN MODE, 1 SEC START.
                                                                ;****                   ****
034150                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
```

```
        034150  104410                                                                          TRAP    C$ESCAPE
        034152  000402                                                                          .WORD   L10073-.
    44
    45  034154                                  BACCIR                  ;BUFFER ADDRESS/CHARACTER COUNT REC. IN
                                                                        ;**** MACRO EXPANSION ****
        034154  004737  012270                  JSR     PC, $BACC       ;CALL BA/CC IN ROUTINE WITH DEFAULTS
        034160  000044                                  .WORD   RQI!BACCR       ;BA/CC IN RECEIVE COMMAND
        034162  002570                                  .WORD   RBUF    ;RECEIVE BUFFER
        034164  000044                                  .WORD   RCOUNT  ;RECEIVE CHARACTER COUNT
                                                                        ;****                   ****
    46
    47  034166                                  ESCAPE  TST             ;IF ERROR (I.E. RDI NOT SET), ESCAPE
        034166  104410                                                                          TRAP    C$ESCAPE
        034170  000364                                                                          .WORD   L10073-.
    48
    49  034172                                  BACCIT                  ;BUFFER ADDRESS/CHARACTER COUNT XMIT. IN
                                                                        ;**** MACRO EXPANSION ****
        034172  004737  012270                  JSR     PC, $BACC       ;CALL BA/CC IN ROUTINE WITH DEFAULTS
        034176  000040                                  .WORD   RQI!BACCT       ;BA/CC IN TRANSMIT COMMAND
        034200  002520                                  .WORD   TBUF    ;TRANSMIT BUFFER ADDRESS
        034202  000044                                  .WORD   TCOUNT  ;TRANSMIT CHARACTER COUNT
                                                                        ;****                   ****
    50
    51  034204                                  ESCAPE  TST             ;IF ERROR (I.E. RDI NOT SET), ESCAPE
        034204  104410                                                                          TRAP    C$ESCAPE
        034206  000346                                                                          .WORD   L10073-.
    52
    53  034210                          20$:
    54  034210                                  WAIT    RDO             ;WAIT FOR RDO
                                                                        ;**** MACRO EXPANSION ****
        034210  004737  010274                  JSR     PC, $WAIT       ;CALL WAIT ROUTINE
        034214  000001                                  .WORD   1       ;FLAG THAT WE'RE WAITING FOR RDO
                                                                        ;****                   ****
    55  034216                                  BERROR  52$             ;IF ERROR - RDO NOT SET, END TEST
        034216  103552                                                                          BCS     52$
    56  034220  032777  000001  146006         BIT     #CNTRL,@SEL2    ;IS THIS A CONTROL OUT COMMAND ?
    57  034226  001405                          BEQ     25$             ;IF NOT - PROCEED
    58  034230                                  ERRDF   9,EMG9,ERRG2    ;UNEXPECTED CONTROL OUT RECEIVED
        034230  104455                                                                          TRAP    C$ERDF
        034232  000011                                                                          .WORD   9
        034234  020026                                                                          .WORD   EMG9
        034236  015112                                                                          .WORD   ERRG2
    59  034240  000541                          BR      52$
    60  034242                          25$:
    61  034242  032777  000004  145764          BIT     #RCV,@SEL2      ;TRANSMIT OR RECEIVE ?
    62  034250  001035                          BNE     40$             ;BR FOR RECEIVE
    63
    64                                  ;CHECK TRANSMIT
    65
    66  034252  005737  002516                  TST     TFLAG           ;IS THIS THE FIRST TRANSMIT DONE?
    67  034256  001405                          BEQ     30$             ;YES - OK
    68  034260                                  ERRDF   10,EMG10,ERRG2  ;ERROR MULTIPLE TRANSMITS
        034260  104455                                                                          TRAP    C$ERDF
        034262  000012                                                                          .WORD   10
        034264  020055                                                                          .WORD   EMG10
        034266  015112                                                                          .WORD   ERRG2
    69  034270  000525                          BR      52$
```

```
034272                          30$:
034272  012737  177777  002516          MOV     #-1,TFLAG       ;FLAG THAT TRANSMIT CHECK IS DONE.
034300  022777  002520  145730          CMP     #TBUF,@SEL4     ;TRANSMIT BUFFER ADDRESS CORRECT?
034306  001405                          BEQ     32$             ;YES - PROCEED
034310                                  ERRDF   11,EMG11,ERRG2  ;BUFFER ADDRESS ERROR
034310  104455                                                                          TRAP    C$ERDF
034312  000013                                                                          .WORD   11
034314  020104                                                                          .WORD   EMG11
034316  015112                                                                          .WORD   ERRG2
034320  000511                          BR      52$
034322                          32$:
034322  022777  000044  145710          CMP     #TCOUNT,@SEL6   ;COUNT CORRECT ?
034330  001470                          BEQ     50$             ;YES - PROCEED
034332                                  ERRDF   12,EMG12,ERRG2  ;CHARACTER COUNT ERROR
034332  104455                                                                          TRAP    C$ERDF
034334  000014                                                                          .WORD   12
034336  020127                                                                          .WORD   EMG12
034340  015112                                                                          .WORD   ERRG2
034342  000500                          BR      52$

                                ;CHECK RECEIVE

034344                          40$:
034344  005737  002566                  TST     RFLAG           ;IS THIS THE FIRST RECEIVE DONE ?
034350  001405                          BEQ     41$             ;YES - PROCEED
034352                                  ERRDF   13,EMG13,ERRG2  ;MULTIPLE RECEIVES
034352  104455                                                                          TRAP    C$ERDF
034354  000015                                                                          .WORD   13
034356  020155                                                                          .WORD   EMG13
034360  015112                                                                          .WORD   ERRG2
034362  000470                          BR      52$
034364                          41$:
034364  012737  177777  002566          MOV     #-1,RFLAG       ;FLAG THAT RECEIVE CHECK HAS BEEN DONE.
034372  022777  002570  145636          CMP     #RBUF,@SEL4     ;IS THE RECEIVE BUFFER ADDRESS CORRECT?
034400  001405                          BEQ     43$             ;YES - PROCEED
034402                                  ERRDF   11,EMG11,ERRG2  ;BUFFER ADDRESS ERROR
034402  104455                                                                          TRAP    C$ERDF
034404  000013                                                                          .WORD   11
034406  020104                                                                          .WORD   EMG11
034410  015112                                                                          .WORD   ERRG2
034412  000454                          BR      52$
034414                          43$:
034414  022777  000044  145616          CMP     #RCOUNT,@SEL6   ;IS THE BUFFER COUNT CORRECT?
034422  001405                          BEQ     44$             ;YES - PROCEED
034424                                  ERRDF   12,EMG12,ERRG2  ;CHARACTER COUNT ERROR
034424  104455                                                                          TRAP    C$ERDF
034426  000014                                                                          .WORD   12
034430  020127                                                                          .WORD   EMG12
034432  015112                                                                          .WORD   ERRG2
034434  000443                          BR      52$
034436                          44$:
034436  012700  000044                  MOV     #RCOUNT,R0      ;SET UP FOR DATA CHECK (CHARCATER COUNT)
034442  012701  002520                  MOV     #TBUF,R1        ;GOOD DATA POINTER
034446  012702  002570                  MOV     #RBUF,R2        ;RECEIVE DATA POINTER
034452                          45$:
034452  122122                          CMPB    (R1)+,(R2)+     ;IS THE DATA THE SAME ?
034454  001011                          BNE     46$             ;IF NOT, BRANCH TO DATA ERROR MESSAGE
```

```
034456  005300                          DEC     R0              ;CONTINUE CHECKING UNTIL DONE WITH BUFFER.
034460  001374                          BNE     45$
034462  005712                          TST     @R2             ;THIS SHOULD BE 0 - REMEMBER WE CLEARED
                                                                ;2 EXTRA BYTES DURING BUFFER INIT.
034464  001412                          BEQ     50$             ;IF OK - PROCEED
034466                                  ERRDF   14,EMG14,ERRG2  ;RECEIVED EXTRA DATA
034466  104455                                                                                  TRAP    C$ERDF
034470  000016                                                                                  .WORD   14
034472  020203                                                                                  .WORD   EMG14
034474  015112                                                                                  .WORD   ERRG2
034476  000422                          BR      52$
034500                          45$:
034500                                  ERRDF   15,EMG15,ERRG2  ;DATA ERROR
034500  104455                                                                                  TRAP    C$ERDF
034502  000017                                                                                  .WORD   15
034504  020223                                                                                  .WORD   EMG15
034506  015112                                                                                  .WORD   ERRG2
034510  000415                          BR      52$

                                ; TRANSMIT OR RECEIVE CHECK DONE

034512                          50$:
034512  042777  000213  145514          BIC     #RDO+RCV+CMD,@SEL2 ;CLEAR RDO, RCV & COMMMAND BITS (0,1)
034520  005737  002566                  TST     RFLAG           ;IS THE RECEIVE DONE ? (IF DONE, FLAG = -1)
034524  001002                          BNE     51$             ;YES - SEE IF TRANSMIT DONE
034526  000137  034210                  JMP     20$             ;NO - GO BACK AND DO IT.
034532                          51$:
034532  005737  002516                  TST     TFLAG           ;IS THE TRANSMIT DONE ?
034536  001002                          BNE     52$             ;YES - BR TO SHUTDOWN
034540  000137  034210                  JMP     20$             ;NO - DO IT
034544                          52$:
034544                                  SHUTDN                  ;SHUTDOWN DMR
                                                                ;**** MACRO EXPANSION ****
034544  004737  012550                  JSR     PC, $HALT       ;DMR HALT ROUTINE.
                                                                ;****                   ****

034550                                  CALL    $ERROR          ;CHECK BASE TABLE AND REPORT ANY SOFT ERRORS

034554                          ENDTST
034554                                                                          L10073:
034554  104401                                                                          TRAP    C$ETST
```

```
                                .SBTTL          TEST 14 - EXTENDED ADDRESSING DATA TEST

                                ;*******************************************************************
                                ;*              TEST  14 - DMR-11
                                ;* IN THIS TEST - SEE IF WE HAVE MEMORY MANAGEMENT, IF SO SEE IF WE
                                ;* HAVE THE MEMORY TO CHECK BITS 16 & 17 IN SEL6.  THIS WILL ALLOW
                                ;* US TO TRANSFER DATA USING THOSE EXTENDED ADDRESSING BITS. AS IN
                                ;* TEST 13 THE TEST IS NON-INTERRUPT AND INTERNAL (TTL) LOOPBACK IS
                                ;* USED.
                                ;*
                                ;*******************************************************************
034556                          EXNTST
034556                                                                          T14::
                                        .ENABL  LSB             ;ENABLE LOCAL BLOCK - NEEDED BECAUSE OF
                                                                ;USE  OF SYMBOLIC LABELS "RSFL4" ETC.
034556                                  SETVEC  #4,#NOXMEM,#PRI07 ;SET UP TRAP VECTOR 4
034556  012746  000340                                                          MOV     #PRI07,-(SP)
034562  012746  023572                                                          MOV     #NOXMEM,-(SP)
034566  012746  000004                                                          MOV     #4,-(SP)
034572  012746  000003                                                          MOV     #3,-(SP)
034576  104437                                                                  TRAP    C$SVEC
034600  062706  000010                                                          ADD     #10,SP
034604  005037  002350                  CLR     NXMFLG          ;CLEAR FLAG - SET IF TRAP TO 4.
034610  005737  177572                  TST     @#177572        ;ADDRESS MEMORY MANAGEMENT REGISTER.
034614                                  CLRVEC  #4              ;RESTORE TRAP VECTOR 4.
034614  012700  000004                                                          MOV     #4,R0
034620  104436                                                                  TRAP    C$CVEC
034622  005737  002350                  TST     NXMFLG          ;IS THE FLAG STILL CLEARED?
                                                                ;NOTE: THE FLAG WILL BE SET BY TRAP 4
                                                                ;IF THERE IS NO MEMORY MANAGEMENT.
034626  001404                          BEQ     10$             ;IF FLAG IS CLEARED, PROCEED WITH TEST.
034630  005037  002350                  CLR     NXMFLG          ;RESTORE FLAG
034634  000137  036200                  JMP     85$             ;EXIT - CAN'T TEST WITHOUT MEM. MANAG.
034640                          10$:
                                                                ;NOTE: L$HIMEM IS SIZE OF TOTAL MEMORY IN
                                                                ;PAGE ADDRESS REGISTER FORM - DETERMINED BY
                                                                ;BY DIAGNOSTIC SUPERVISOR AT STARTUP.
034640  023727  002120  002200          CMP     L$HIMEM,#2200   ;DO WE HAVE ENOUGH MEMORY TO ADDRESS BIT 16?
034646  002002                          BGE     15$             ;IF YES - PROCEED WITH TEST
034650  000137  036200                  JMP     85$             ;IF NOT - EXIT
034654                          15$:
034654                                  SETPRI  #PRI07          ;MAKE SURE WE ARE IN KERNEL MODE.
034654  012700  000340                                                          MOV     #PRI07,R0
034660  104441                                                                  TRAP    C$SPRI
                                                                ;SETTING PRI SHOULD ALSO CLEAR BITS 14 &15
                                                                ;IN PSW WHICH PLACES PROCESSOR IN KERNEL MODE.
034662  012701  172300                  MOV     #172300,R1      ;GET ADDRESS OF KERNEL PDR  REG 0
034666  012700  000010                  MOV     #8.,R0          ;GOING TO WRITE PDR REG 0-7
034672                          20$:
034672  012721  077406                  MOV     #77406,(R1)+    ;WRITE BITS FOR THE FOLLOWING PAGE DESCRIPTION
                                                                ;READ/WRITE ACCESS, 128. BLOCK PAGE LENGTH.
034676  005300                          DEC     R0              ;WRITE ALL PDRS
034700  001374                          BNE     20$
034702  012701  172340                  MOV     #172340,R1      ;GET ADDRESS OF KERNAL PAR 0
034706  005011                          CLR     (R1)            ;PAR 0, ADDRS      0  -  17776
034710  012761  000200  000002          MOV     #200,2(R1)      ;PAR 1, ADDRS  20000  -  37776
034716  012761  000400  000004          MOV     #400,4(R1)      ;PAR 2, ADDRS  40000  -  57776
```

```
034724  012761  000600  000006          MOV     #600,6(R1)        ;PAR 3, ADDRS  60000  -  77776
034732  012761  001000  000010          MOV     #1000,10(R1)      ;PAR 4, ADDRS 100000  - 117776
034740  012761  002000  000012          MOV     #2000,12(R1)      ;PAR 5, ADDRS 200000  - 217776
034746  012761  004000  000014          MOV     #4000,14(R1)      ;PAR 6, ADDRS 400000  - 417776
034754  012761  007600  000016          MOV     #7600,16(R1)      ;PAR 7, ADDRS 160000  - 177776 (I/O PAGE)

034762  012703  000100                  MOV     #64.,R3           ;COUNTER FOR OUTER LOOP OF TEST PATTERN GEN.
034766  012704  120000                  MOV     #120000,R4        ;USE VIRTUAL ADDRESS TO MAP TO PAR 5
                                                                  ;GENERATE A TEST PATTERN IN THE 1ST 4K
                                                                  ;BYTES OF PAR 5 (VIRTUAL ADDR 120000 - 127776)
034772  005037  002350                  CLR     NXMFLG            ;ENSURE FLAG IS CLEARED
034776                                  SETVEC  #4,#NOXMEM,#PRI07 ;SET UP TRAP VECTOR 4 (WILL SET FLAG)
034776  012746  000340                                                                    MOV     #PRI07,-(SP)
035002  012746  023572                                                                    MOV     #NOXMEM,-(SP)
035006  012746  000004                                                                    MOV     #4,-(SP)
035012  012746  000003                                                                    MOV     #3,-(SP)
035016  104437                                                                            TRAP    C$SVEC
035020  062706  000010                                                                    ADD     #10,SP
035024  012737  000001  177572          MOV     #1,@#177572       ;ENABLE MEMORY MANAGEMENT
035032                          21$:
035032  012701  000040                  MOV     #32.,R1           ;COUNTER FOR INNER LOOP OF TEST PATTERN GEN.
035036  012702  002416                  MOV     #$CCITT,R2        ;ADDRESS FOR 32. WORD TEST PATTERN
035042                          22$:
035042  012224                          MOV     (R2)+,(R4)+       ;WRITE TEST PATTERN INTO 4K BYTES
                                                                  ;(PHYSICAL ADDRESS 200000 - 207776)
035044  005737  002350                  TST     NXMFLG            ;NXM TRAP 4?
035050  001014                          BNE     24$               ;IF YES - EXIT
035052  005301                          DEC     R1                ;DO THE INNER LOOP 32. TIMES
035054  001372                          BNE     22$
035056  005303                          DEC     R3                ;DO THE OUTER LOOP 128. TIMES
035060  001364                          BNE     21$
035062  012701  004000                  MOV     #4000,R1          ;COUNTER TO CLEAR THE NEXT 4K BYTES.
035066                          23$:
035066  005024                          CLR     (R4)+             ;CLEAR OUT THE ENTIRE PAR
                                                                  ;(PHYSICAL ADDRESS 210000 - 217776)
035070  005737  002350                  TST     NXMFLG            ;NXM TRAP 4?
035074  001002                          BNE     24$               ;IF YES - EXIT
035076  005301                          DEC     R1
035100  001372                          BNE     23$
035102                          24$:
035102  005037  177572                  CLR     @#177572          ;TURN OFF MEMORY MANAGEMENT
035106                                  CLRVEC  #4                ;RESTORE TRAP 4 TO SUPERVISOR
035106  012700  000004                                                                    MOV     #4,R0
035112  104436                                                                            TRAP    C$CVEC
035114  005737  002350                  TST     NXMFLG            ;WAS THIS AN ERROR EXIT
035120  001417                          BEQ     25$               ;IF NOT, PROCEED.
035122                                  ERRDF   19,EMT22
035122  104455                                                                            TRAP    C$ERDF
035124  000023                                                                            .WORD   19
035126  036202                                                                            .WORD   EMT22
035130  000000                                                                            .WORD   0
035132                                  PRINTB  #FMT25,R4
035132  010446                                                                            MOV     R4,-(SP)
035134  012746  036240                                                                    MOV     #FMT25,-(SP)
035140  012746  000002                                                                    MOV     #2,-(SP)
035144  010600                                                                            MOV     SP,R0
035146  104414                                                                            TRAP    C$PNTB
```

```
        035150  062706  000006                                                          ADD     #6,SP
     87 035154  000137  036200                JMP     85$
     88 035160                          25$:
     89 035160                                CLEAR                   ;MACRO FOR MASTER CLEAR
                                                                      ;**** MACRO EXPANSION ****
        035160  004737  011066                JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                                      ;****                 ****
     90
     91 035164                                ESCAPE  TST             ;IF ERROR, BR TO TEST END.
        035164  104410                                                                    TRAP    C$ESCAPE
        035166  001012                                                                    .WORD   L10074-.
     92
     93 035170  005737  002254                TST     DMTURN          ;IS INTERNAL LOOPBACK DESIRED?
     94 035174  001004                        BNE     30$             ;IF NOT, CLEAR INTERNAL LOOPBACK.
     95 035176  052737  004000  035220        BIS     #LPLU,100$      ;SET LINE UNIT LOOPBACK.
     96 035204  000403                        BR      32$
     97 035206                          30$:
     98 035206  042737  004000  035220        BIC     #LPLU,100$      ;CLEAR LINE UNIT LOOPBACK.
     99 035214                          32$:
    100 035214                                CALL    $BASEI          ;BASE IN COMMAND.
    101 035220  000000                  100$:         .WORD   0       ;MAINTENANCE BITS (LINE UNIT LOOP)
    102 035222  002636                            .WORD   BASE        ;BASE TABLE ADDRESS
    103 035224  000522                            .WORD   DMR         ;DMR MODE
    104 035226                                ESCAPE  TST             ;IF ERROR, BR TO TEST END.
        035226  104410                                                                    TRAP    C$ESCAPE
        035230  000750                                                                    .WORD   L10074-.
    105
    106 035232                                CALL    $LOOP           ;DMR COMMAND TO SET MAINT. BITS
    107 035236                                ESCAPF  TST             ;IF ERROR, BR TO TEST END.
        035236  104410                                                                    TRAP    C$ESCAPE
        035240  000740                                                                    .WORD   L10074-.
    108
    109 035242                                CNTRIN                  ;MACRO FOR CONTROL IN (FULL DUPLEX)
                                                                      ;**** MACRO EXPANSION ****
        035242  004737  011520                JSR     PC, $CNTIN      ;CALL CONTROL IN ROUTINE WITH DEFAULT
        035246  000000                                .WORD   0       ;SEL6 - FULL DUPLEX, RUN MODE, 1 SEC START.
                                                                      ;****                 ****
    110 035250                                ESCAPE  TST             ;IF ERROR, BR TO TEST END.
        035250  104410                                                                    TRAP    C$ESCAPE
        035252  000726                                                                    .WORD   L10074-.
    111
    112 035254  005037  002516                CLR     TFLAG           ;CLEAR TRANSMIT FLAG
    113 035260  005037  002566                CLR     RFLAG           ;CLEAR RECEIVE FLAG
    114 035264  005037  002344                CLR     SFLAG           ;CLEAR SECOND LOOP FLAG
    115                                                               ;IF SFLAG = 0, THEN THIS IS A TEST OF BIT 16
    116                                                               ;IF SFLAG = -1, THEN THIS IS A TEST OF BIT 17
    117 035270  012737  010000  035324        MOV     #10000,RSEL4    ;RECEIVE BUFFER ADDRESS (BITS 0-15)
    118 035276  012737  050000  035326        MOV     #BIT14!10000,RSEL6 ;REC BUFFER ADDR BIT 16 SET AND 4K
    119                                                               ;BYTE RECEIVE CHARACTER COUNT
    120 035304  005037  035342                CLR     TSEL4           ;TRANSMIT BUFFER ADDRESS (BITS 0-15)
    121 035310  012737  050000  035344        MOV     #BIT14!10000,TSEL6 ;XMIT BUFFER ADDR BIT 16 SET AND 4K
    122                                                               ;BYTE XMIT CHARACTER COUNT
    123 035316                          35$:
    124 035316                                CALL    $BACC           ;ISSUE THE BUFFER ADDR/ CHAR COUNT COMMAND
    125 035322  000044                            .WORD   RQI!BACCR       ;COMMAND FOR BA/CC IN RECEIVE
    126 035324  000000                  RSEL4:    .WORD   0           ;BUFFER ADDRESS BITS 0-15
    127 035326  000000                  RSEL6:    .WORD   0           ;BUFFER ADDR BIT 16 + CHAR. COUNT
```

```
    128 035330                                  ESCAPE  TST             ;IF ERROR, END TEST
        035330  104410                                                                          TRAP    C$ESCAPE
        035332  000646                                                                          .WORD   L10074-.
    129
    130 035334                                  CALL    $BACC           ;ISSUE THE BUFFER ADDR/ CHAR COUNT COMMAND
    131 035340  000040                                  .WORD   RQI!BACCT       ;COMMAND FOR BA/CC IN TRANSMIT
    132 035342  000000                  TSEL4:          .WORD   0       ;BUFFER ADDRESS BITS 0-15
    133 035344  000000                  TSEL6:          .WORD   0       ;BUFFER ADDR BIT 16 + CHAR. COUNT
    134 035346                                  ESCAPE  TST             ;IF ERROR, END TEST
        035346  104410                                                                          TRAP    C$ESCAPE
        035350  000630                                                                          .WORD   L10074-.
    135 035352                          40$:
    136 035352                                  WAIT    RDO             ;WAIT FOR RDO TO BE SET
                                                                        ;**** MACRO EXPANSION ****
        035352  004737  010274                  JSR     PC, $WAIT       ;CALL WAIT ROUTINE
        035356  000001                                  .WORD   1       ;FLAG THAT WE'RE WAITING FOR PDO
                                                                        ;****                   ****
    137 035360                                  ESCAPE  TST             ;IF RDO NOT SET BEFORE TIMEOUT, END TEST
        035360  104410                                                                          TRAP    C$ESCAPE
        035362  000616                                                                          .WORD   L10074-.
    138
    139 035364  032777  000001  144642          BIT     #CNTRL,@SEL2    ;IS THIS A CONTROL OUT COMMAND?
    140 035372  001406                          BEQ     50$             ;NO - PROCEED
    141 035374                                  ERRDF   9,EMG9,ERRG2    ;UNEXPECTED CONTROL OUT.
        035374  104455                                                                          TRAP    C$ERDF
        035376  000011                                                                          .WORD   9
        035400  020026                                                                          .WORD   EMG9
        035402  015112                                                                          .WORD   ERRG2
    142 035404  000137  036170                  JMP     80$             ;EXIT
    143 035410                          50$:
    144 035410  032777  000004  144616          BIT     #RCV,@SEL2      ;IS THIS A TRANSMIT OR RECEIVE?
    145 035416  001040                          BNE     60$             ;BR FOR RECEIVE
    146 035420  005737  002516                  TST     TFLAG           ;IS THIS THE 1ST TRANSMIT DONE
    147 035424  001406                          BEQ     55$             ;IF YES, PROCEED
    148 035426                                  ERRDF   10,EMG10,ERRG2  ;MULTIPLE TRANSMITS
        035426  104455                                                                          TRAP    C$ERDF
        035430  000012                                                                          .WORD   10
        035432  020055                                                                          .WORD   EMG10
        035434  015112                                                                          .WORD   ERRG2
    149 035436  000137  036170                  JMP     80$             ;EXIT
    150 035442                          55$:
    151 035442  012737  177777  002516          MOV     #-1,TFLAG       ;FLAG THAT THE TRANSMIT IS DONE.
    152 035450  023777  035342  144560          CMP     TSEL4,@SEL4     ;IS THE BUFFER ADDRESS CORRECT?
    153 035456  001406                          BEQ     56$             ;IF OK, PROCEED WITH CHECK.
    154 035460                                  ERRDF   11,EMG11,ERRG2  ;BUFFER ADDRESS ERROR
        035460  104455                                                                          TRAP    C$ERDF
        035462  000013                                                                          .WORD   11
        035464  020104                                                                          .WORD   EMG11
        035466  015112                                                                          .WORD   ERRG2
    155 035470  000137  036170                  JMP     80$             ;EXIT
    156 035474                          56$:
    157 035474  023777  035344  144536          CMP     TSEL6,@SEL6     ;IS THE CHAR. COUNT CORRECT?
    158 035502  001502                          BEQ     70$             ;IF OK, PROCEED
    159 035504                                  ERRDF   12,EMG12,ERRG2  ;CHARACTER COUNT ERROR - OR EXT MEM PROBLEM
        035504  104455                                                                          TRAP    C$ERDF
        035506  000014                                                                          .WORD   12
        035510  020127                                                                          .WORD   EMG12
```

```
        035512  015112                                                                          .WORD   ERRG2
    160 035514  000137  036170                  JMP     80$             ;EXIT
    161 035520                          60$:
    162 035520  005737  002566                  TST     RFLAG           ;IS THIS THE 1ST RECEIVE DONE
    163 035524  001406                          BEQ     61$             ;IF YES, PROCEED
    164 035526                                  ERRDF   13,EMG13,ERRG2  ;MULTIPLE RECEIVES
        035526  104455                                                                          TRAP    C$ERDF
        035530  000015                                                                          .WORD   13
        035532  020155                                                                          .WORD   EMG13
        035534  015112                                                                          .WORD   ERRG2
    165 035536  000137  036170                  JMP     80$             ;EXIT
    166 035542                          61$:
    167 035542  012737  177777  002566          MOV     #-1,RFLAG       ;FLAG THAT THE RECEIVE IS DONE.
    168 035550  023777  035324  144460          CMP     RSEL4,@SEL4     ;IS THE BUFFER ADDRESS CORRECT?
    169 035556  001405                          BEQ     62$             ;IF OK, PROCEED WITH CHECK.
    170 035560                                  ERRDF   11,EMG11,ERRG2  ;BUFFER ADDRESS ERROR
        035560  104455                                                                          TRAP    C$ERDF
        035562  000013                                                                          .WORD   11
        035564  020104                                                                          .WORD   EMG11
        035566  015112                                                                          .WORD   ERRG2
    171 035570  000577                          BR      80$             ;EXIT
    172 035572                          62$:
    173 035572  023777  035326  144440          CMP     RSEL6,@SEL6     ;IS THE CHAR. COUNT CORRECT?
    174 035600  001404                          BEQ     63$             ;IF OK, PROCEED
    175 035602                                  ERRDF   12,EMG12,ERRG2  ;CHARACTER COUNT ERROR
        035602  104455                                                                          TRAP    C$ERDF
        035604  000014                                                                          .WORD   12
        035606  020127                                                                          .WORD   EMG12
        035610  015112                                                                          .WORD   ERRG2
    176 035612                          63$:
    177 035612  005737  002344                  TST     SFLAG           ;WHICH EXTENDED ADDRESS ARE WE CHECKING?
    178 035616  001007                          BNE     65$             ;BR FOR BIT 17 CHECK
    179 035620  012700  004000                  MOV     #4000,R0        ;IN THE TEST OF BIT 16 WE SENT 4K BYTES
    180 035624  012701  120000                  MOV     #120000,R1      ;THE XMIT BUFFER BEGAN AT THIS VIRTUAL ADDR
    181                                                                 ;WHICH WILL MAP TO 200000
    182 035630  012702  130000                  MOV     #130000,R2      ;THE REC BUF. MAPS TO 210000
    183 035634  000406                          BR      66$             ;GO COMPARE THE XMIT AND REC BUFFERS
    184 035636                          65$:
    185 035636  012700  010000                  MOV     #10000,R0       ;IN THE TEST OF BIT 17 WE SENT 8K BYTES
    186 035642  012701  120000                  MOV     #120000,R1      ;THE XMIT BUFFER MAPS TO 200000
    187 035646  012702  140000                  MOV     #140000,R2      ;THE REC BUF. MAPS TO 400000
    188 035652                          66$:
    189 035652  012737  000001  177572          MOV     #1,@#177572     ;TURN MEMORY MANAGEMENT BACK ON.
    190 035660                          67$:
    191 035660  022122                          CMP     (R1)+,(R2)+     ;IS THE DATA THE SAME?
    192 035662  001003                          BNE     68$             ;IF NOT THERE IS A DATA ERROR.
    193 035664  005300                          DEC     R0              ;CHECK ENTIRE BUFFER
    194 035666  001374                          BNE     67$
    195 035670  000407                          BR      70$             ;IF DATA OK, PROCEED WITH TEST.
    196 035672                          68$:
    197 035672  005037  177572                  CLR     @#177572        ;TURN MEMORY MANAGEMENT OFF.
    198 035676                                  ERRDF   15,EMG15,ERRG2  ;DATA ERROR
        035676  104455                                                                          TRAP    C$ERDF
        035700  000017                                                                          .WORD   15
        035702  020223                                                                          .WORD   EMG15
        035704  015112                                                                          .WORD   ERRG2
    199 035706  000530                          BR      80$             ;EXIT
```

```
035710                                  70$:
035710  005037  177572                          CLR     @#177572        ;TURN MEMORY MANAGEMENT OFF.
035714  042777  000213  144312                  BIC     #RDO+RCV+CMD,@SEL2 ;CLEAR RDO, RCV & COMMMAND BITS (0,1)
035722  005737  002566                          TST     RFLAG           ;IS THE RECEIVE DONE ? (IF DONE, FLAG = -1)
035726  001002                                  BNE     71$             ;YES - SEE IF TRANSMIT DONE
035730  000137  035352                          JMP     40$             ;NO - GO BACK AND DO IT.
035734                                  71$:
035734  005737  002516                          TST     TFLAG           ;IS THE TRANSMIT DONE ?
035740  001002                                  BNE     72$             ;YES - SEE IF THERE IS MORE
035742  000137  035352                          JMP     40$             ;NO - DO IT
035746                                  72$:
035746  005737  002344                          TST     SFLAG           ;HAVE WE ALREADY TESTED BIT 17
035752  001106                                  BNE     80$             ;IF SO - END OF TEST

035754  012737  177777  002344                  MOV     #-1,SFLAG       ;FLAG SO WE DON'T COME THIS WAY AGAIN.
035762  023727  002120  004200                  CMP     L$HIMEM,#4200   ;IS THERE ENOUGH MEMORY TO TEST BIT 17?
035770  002477                                  BLT     80$             ;IF NOT - END OF TEST.
035772  005037  002516                          CLR     TFLAG           ;CLEAR FLAGS FOR NEXT TEST
035776  005037  002566                          CLR     RFLAG
                                        ;
                                        ;SET UP TO TEST BIT 17, IF THERE IS ENOUGH MEMORY.
                                        ;THIS TEST WILL TRANSMIT 8K BYTES STARTING AT PHYSICAL ADDRESS 200000
                                        ;TO PHYSICAL ADDRESS 400000.  THE TRANSMITTED BUFFER STILL CONTAINS
                                        ;THE TEST PATTERN GENERATED IN THE BIT 16 TEST.
                                        ;
036002  005037  035324                          CLR     RSEL4           ;RECEIVE BUFFER ADDRESS (BITS 0-15)
036006  012737  120000  035326                  MOV     #BIT15!20000,RSEL6 ;REC BUFFER ADDR BIT 17 SET AND 8K
                                                                        ;BYTE RECEIVE CHARACTER COUNT
036014  005037  035342                          CLR     TSEL4           ;TRANSMIT BUFFER ADDRESS (BITS 0-15)
036020  012737  060000  035344                  MOV     #BIT14!20000,TSEL6 ;XMIT BUFFER ADDR BIT 16 SET AND 8K
                                                                        ;BYTE XMIT CHARACTER COUNT
036026  012701  010000                          MOV     #10000,R1       ;COUNTER TO CLEAR 8K BYTES
036032  012704  140000                          MOV     #140000,R4      ;VIRTUAL ADDRESS THAT WILL MAP INTO PAR 6
                                                                        ;WITH THE PHYSICAL ADDRESS 400000
036036  005037  002350                          CLR     NXMFLG          ;ENSURE FLAG IS CLEAR
036042                                          SETVEC  #4,#NOXMEM,#PRI07 ;SET UP TRAP TO VECTOR 4 (WILL SET FLAG)
        036042  012746  000340                                                          MOV     #PRI07,-(SP)
        036046  012746  023572                                                          MOV     #NOXMEM,-(SP)
        036052  012746  000004                                                          MOV     #4,-(SP)
        036056  012746  000003                                                          MOV     #3,-(SP)
        036062  104437                                                                  TRAP    C$SVEC
        036064  062706  000010                                                          ADD     #10,SP
036070  012737  000001  177572                  MOV     #1,@#177572     ;TURN ON MEMORY MANAGEMENT
036076                                  74$:
036076  005024                                  CLR     (R4)+           ;CLEAR 400000 - 417776
036100  005737  002350                          TST     NXMFLG          ;DOES A NXM TRAP 4 OCCUR?
036104  001002                                  BNE     75$             ;IF YES, EXIT
036106  005300                                  DEC     R0
036110  001372                                  BNE     74$
036112                                  75$:
036112  005037  177572                          CLR     @#177572        ;TURN OFF MEMORY MANAGEMENT
036116                                          CLRVEC  #4              ;RESTORE TRAP 4
        036116  012700  000004                                                          MOV     #4,R0
        036122  104436                                                                  TRAP    C$CVEC
036124  005737  002350                          TST     NXMFLG          ;WAS THIS AN ERROR EXIT?
036130  001002                                  BNE     76$             ;IF YES - REPORT ERROR
036132  000137  035316                          JMP     35$             ;START THE SECOND TEST
```

```
    249 036136                          76$:
    250 036136                                  ERRDF   19,EMT22
        036136  104455                                                          TRAP    C$ERDF
        036140  000023                                                          .WORD   19
        036142  036202                                                          .WORD   EMT22
        036144  000000                                                          .WORD   0
    251 036146                                  PRINTB  #FMT25,R4
        036146  010446                                                          MOV     R4,-(SP)
        036150  012746  036240                                                  MOV     #FMT25,-(SP)
        036154  012746  000002                                                  MOV     #2,-(SP)
        036160  010600                                                          MOV     SP,R0
        036162  104414                                                          TRAP    C$PNTB
        036164  062706  000006                                                  ADD     #6,SP
    252 036170                          80$:
    253 036170                                  SHUTDN                  ;SHUTDOWN DMR
                                                                        ;**** MACRO EXPANSION ****
        036170  004737  012550                  JSR     PC, $HALT       ;DMR HALT ROUTINE.
                                                                        ;****                   ****
    254 036174                                  CALL    $ERROR          ;CHECK BASE TABLE AND REPORT ANY SOFT ERRORS
    255
    256 036200                          85$:
    257                                         .DSABL  LSB             ;DISABLE LOCAL SYMBOL BLOCK
    258 036200                          ENDTST
        036200                                                                  L10074:
        036200  104401                                                          TRAP    C$ETST
    259
    260
    261 036202      103     101     116 EMT22:  .ASCIZ  /CAN'T ADDRESS EXTENDED MEMORY/
        036205      047     124     040
        036210      101     104     104
        036213      122     105     123
        036216      123     040     105
        036221      130     124     105
        036224      116     104     105
        036227      104     040     115
        036232      105     115     117
        036235      122     131     000
    262 036240      045     101     115 FMT25:  .ASCIZ  /%AMEMORY ADDRESS %O6% DOES NOT RESPOND - TRAP 4%N/
        036243      105     115     117
        036246      122     131     040
        036251      101     104     104
        036254      122     105     123
        036257      123     040     045
        036262      117     066     045
        036265      040     104     117
        036270      105     123     040
        036273      116     117     124
        036276      040     122     105
        036301      123     120     117
        036304      116     104     040
        036307      055     040     124
        036312      122     101     120
        036315      040     064     045
        036320      116     000
    263                                         .EVEN
```

```
                                        .SBTTL          TEST 15 - DMC MODE (RESUME) INTERRUPT TEST

                                        ;*******************************************************************
                                        ;*              TEST 15 - DMR-11
                                        ;* RESUME BASE IN - DMC MODE
                                        ;* **  WILL NOT RUN IF MODEM LOOPBACK IS SELECTED  **
                                        ;* IN THIS TEST THE DMR WILL TRANSMIT AND RECEIVE 7 BUFFERS. DURING THE
                                        ;* TEST THE DMR WILL BE HALTED AND RESTARTED BY A BASE-IN RESUME IN THE
                                        ;* FOLLOWING MANNER:
                                        ;*      BASE IN
                                        ;*      CONTROL IN
                                        ;*      HALT    -       BASE IN RESUME
                                        ;*      2 BA/CC IN RECEIVE
                                        ;*      HALT    -       BASE IN RESUME
                                        ;*      2 BA/CC IN RECEIVE
                                        ;*      HALT    -       BASE IN RESUME
                                        ;*      2 BA/CC IN RECEIVE
                                        ;*      HALT    -       BASE IN RESUME
                                        ;*      1 BA/CC IN RECEIVE
                                        ;*      HALT    -       BASE IN RESUME
                                        ;*      2 BA/CC IN TRANSMIT
                                        ;*      HALT    -       BASE IN RESUME
                                        ;*      2 BA/CC IN TRANSMIT
                                        ;*      HALT    -       BASE IN RESUME
                                        ;*      2 BA/CC IN TRANSMIT
                                        ;*      HALT    -       BASE IN RESUME
                                        ;*      1 BA/CC IN TRANSMIT
                                        ;*      HALT    -       BASE IN RESUME
                                        ;*
                                        ;*      ALL BA/CC OUTS RECEIVES AND TRANSMITS WILL BE ACCOUNTED FOR AND
                                        ;*      THE CHARACTER COUNTS AND BUFFER ADDRESSES WILL BE CHECKED AGAINST
                                        ;*      THE RECEIVE/TRANSMIT TABLE.
                                        ;*
                                        ;*      THE BUFFERS ARE DETERMINED IN THE SUBROUTINE $BUFFS.  THIS
                                        ;*      SUBROUTINE WILL DETERMINE THE ADDRESS AND CHARACTER COUNT OF
                                        ;*      SEVEN RECEIVE AND SEVEN TRANSMIT BUFFERS.  THE ROUTINE WILL
                                        ;*      ATTEMPT TO USE AS LARGE BUFFERS AS POSSIBLE IN THE FOLLOWING
                                        ;*      HIERARCHY:
                                        ;*              A. IF THERE IS MEMORY MANAGEMENT, USE A PAGE ABOVE 32K.
                                        ;*              B. IF THERE IS FREE MEMORY ABOVE THE SUPERVISOR GREATER
                                        ;*                 THAN 2K BYTES, USE THAT MEMORY
                                        ;*              C. IF NEITHER OF THE PRECEEDING TWO ARE POSSIBLE, USE
                                        ;*                 THE 2K BYTE DEFAULT BUFFER WITHIN THIS DIAGNOSTIC.
                                        ;*
                                        ;*******************************************************************
036322                                  BGNTST
036322                                                                                          T15::
036322  005737  002306                          TST     WMAINT          ;DO WE NEED TO WRITE MODEM
                                                                        ;MAINTENACE 1 OR 2?
036326  001036                                  BNE     40$             ;IF YES WE CAN'T RUN THIS TEST
                                                                        ;(NOTE: CAN'T WRITE MODEM IN DMC MODE)
036330  012737  000007  002324                  MOV     #7,BUFNUM       ;# OF RCV & XMIT BUFFERS.
036336  012737  000001  002274                  MOV     #1,RESUME       ;FLAG SET TO REQUEST USE OF RESUME.
036344  012737  000001  002276                  MOV     #1,DMCMDE       ;FLAG SET TO REQUEST DMC MODE.
036352  005037  002300                          CLR     MNTMDE          ;FLAG NOT TO REQUEST MAINTENANCE MODE.

036356                                          CALL    $BUFFS          ;DETERMINE 7 RCV & 7 XMIT BUFFERS
```

```
 57
 58 036362                                  CLEAR                   ;MASTER CLEAR
                                                                    ;**** MACRO EXPANSION ****
    036362  004737  011066                  JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                                    ;****                   ****
 59
 60 036366                                  ESCAPE  TST             ;IF ERROR, EXIT TEST
    036366  104410                                                                          TRAP    C$ESCAPE
    036370  000034                                                                          .WORD   L10075-.
 61
 62                                                                 ;ISSUE A DMR MODE BASEIN
 63                                                                 ;IN DMR MODE, IF A INTERFACE IS REQUIRED
 64 036372                                  BASEIN                  ;TO BE WRITTEN - IT WILL BE DONE.
                                                                    ;**** MACRO EXPANSION ****
    036372  004737  011264                  JSR     PC, $BASEI      ;CALL BASE IN ROUTINE WITH DEFAULTS
    036376  004000                                  .WORD   LPLU    ;SET LINE UNIT LOOP
    036400  002636                                  .WORD   BASE    ;BASE TABLE ADDRESS
    036402  000522                                  .WORD   DMR     ;DMR-11 MODE
                                                                    ;****                   ****
 65
 66 036404                                  ESCAPE  TST             ;IF ERROR, EXIT TEST
    036404  104410                                                                          TRAP    C$ESCAPE
    036406  000016                                                                          .WORD   L10075-.
 67 036410                                  SHUTDN                  ;HALT
                                                                    ;**** MACRO EXPANSION ****
    036410  004737  012550                  JSR     PC, $HALT       ;DMR HALT ROUTINE.
                                                                    ;****                   ****
 68 036414                                  ESCAPE  TST             ;IF ERROR, EXIT TEST.
    036414  104410                                                                          TRAP    C$ESCAPE
    036416  000006                                                                          .WORD   L10075-.
 69                                                                 ;AFTER SETTING INTERFACE OR LOOPBACK MAINT.
 70                                                                 ;(CAN'T BE DONE IN DMC MODE), START IN
 71                                                                 ;DMC MODE.
 72
 73
 74 036420                                  CALL    $INOUT          ;THIS ROUTINE WILL MANAGE ALL THE DMR
 75                                                                 ;COMMANDS ISSUED IN THE INTERRUPT ROUTINES
 76                                                                 ;(FROM BASE IN UNTIL SHUT DOWN).  BESIDES
 77                                                                 ;CONTROLLING THE SOFTWARE TIMEOUT, THIS
 78                                                                 ;ROUTINE WILL ALSO CHECK THAT BUFFER
 79                                                                 ;CHARACTER COUNTS AND ADDRESSES ARE CORRECT
 80                                                                 ;AND THAT THE DATA IS CORRECT IN THOSE BUFFERS
 81
 82 036424                          40$:
 83 036424                          ENDTST
    036424                                                                          L10075:
    036424  104401                                                                          TRAP    C$ETST
 84
 85
 86
```

```
                                .SBTTL          TEST 16 - DMR MODE (RESUME) INTERRUPT TEST

                                ;*******************************************************************
                                ;*              TEST 16 - DMR-11
                                ;* RESUME BASE IN - DMR MODE
                                ;* IN THIS TEST THE DMR WILL TRANSMIT AND RECEIVE 7 BUFFERS. DURING THE
                                ;* TEST THE DMR WILL BE HALTED AND RESTARTED BY A BASE-IN RESUME IN THE
                                ;* FOLLOWING MANNER:
                                ;*      BASE IN
                                ;*      CONTROL IN
                                ;*      HALT    -       BASE IN RESUME
                                ;*      2 BA/CC IN RECEIVE
                                ;*      HALT    -       BASE IN RESUME
                                ;*      2 BA/CC IN RECEIVE
                                ;*      HALT    -       BASE IN RESUME
                                ;*      2 BA/CC IN RECEIVE
                                ;*      HALT    -       BASE IN RESUME
                                ;*      1 BA/CC IN RECEIVE
                                ;*      HALT    -       BASE IN RESUME
                                ;*      2 BA/CC IN TRANSMIT
                                ;*      HALT    -       BASE IN RESUME
                                ;*      2 BA/CC IN TRANSMIT
                                ;*      HALT    -       BASE IN RESUME
                                ;*      2 BA/CC IN TRANSMIT
                                ;*      HALT    -       BASE IN RESUME
                                ;*      1 BA/CC IN TRANSMIT
                                ;*      HALT    -       BASE IN RESUME
                                ;*
                                ;*      ALL BA/CC OUTS RECEIVES AND TRANSMITS WILL BE ACCOUNTED FOR AND
                                ;*      THE CHARACTER COUNTS AND BUFFER ADDRESSES WILL BE CHECKED AGAINST
                                ;*      THE RECEIVE/TRANSMIT TABLE.
                                ;*
                                ;*      THE BUFFERS ARE DETERMINED IN THE SUBROUTINE $BUFFS.  THIS
                                ;*      SUBROUTINE WILL DETERMINE THE ADDRESS AND CHARACTER COUNT OF
                                ;*      SEVEN RECEIVE AND SEVEN TRANSMIT BUFFERS.  THE ROUTINE WILL
                                ;*      ATTEMPT TO USE AS LARGE BUFFERS AS POSSIBLE IN THE FOLLOWING
                                ;*      HIERARCHY:
                                ;*              A. IF THERE IS MEMORY MANAGEMENT, USE A PAGE ABOVE 32K.
                                ;*              B. IF THERE IS FREE MEMORY ABOVE THE SUPERVISOR GREATER
                                ;*                 THAN 2K BYTES, USE THAT MEMORY
                                ;*              C. IF NEITHER OF THE PRECEEDING TWO ARE POSSIBLE, USE
                                ;*                 THE 2K BYTE DEFAULT BUFFER WITHIN THIS DIAGNOSTIC.
                                ;*
                                ;*
                                ;*******************************************************************
 036426                         BGNTST
 036426                                                                                  T16::
 036426  012737  000007  002324         MOV     #7,BUFNUM       ;# OF RCV & XMIT BUFFERS.
 036434  012737  000001  002274         MOV     #1,RESUME       ;FLAG SET TO REQUEST USE OF RESUME.
 036442  005037  002276                 CLR     DMCMDE          ;FLAG CLEARED - DMR MODE.
 036446  005037  002300                 CLR     MNTMDE          ;FLAG NOT TO REQUEST MAINTENANCE MODE.

 036452                                 CALL    $BUFFS          ;DETERMINE 7 RCV &  7 XMIT BUFFERS

 036456                                 CLEAR                   ;MASTER CLEAR
                                                                ;**** MACRO EXPANSION ****
 036456  004737  011066                 JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
```

```
                                                                ;****                    ****
 55
 56 036462                          ESCAPE  TST                 ;IF ERROR, EXIT TEST
    036462  104410                                                                          TRAP    C$ESCAPE
    036464  000006                                                                          .WORD   L10076-.
 57
 58 036466                          CALL    $INOUT              ;THIS ROUTINE WILL MANAGE ALL THE DMR
 59                                                             ;COMMANDS ISSUED IN THE INTERRUPT ROUTINES
 60                                                             ;(FROM BASE IN UNTIL SHUT DOWN).  BESIDES
 61                                                             ;CONTROLLING THE SOFTWARE TIMEOUT, THIS
 62                                                             ;ROUTINE WILL ALSO CHECK THAT BUFFER
 63                                                             ;CHARACTER COUNTS AND ADDRESSES ARE CORRECT
 64                                                             ;AND THAT THE DATA IS CORRECT IN THOSE BUFFERS
 65
 66
 67
 68 036472                      ENDTST
    036472                                                                      L10076:
    036472  104401                                                                          TRAP    C$ETST
 69
```

```
                                .SBTTL          TEST 17 - DMR MODE INTERRUPT EXERCISE

                                ;*******************************************************************
                                ;*              TEST 17 - DMR-11
                                ;* INTERRUPT DRIVEN EXERCISE
                                ;* IN THIS TEST 64 BUFFERS WILL BE TRANSMITTED AND RECEIVED
                                ;*
                                ;* ALL BA/CC OUTS RECEIVES AND TRANSMITS WILL BE ACCOUNTED FOR AND
                                ;* THE CHARACTER COUNTS AND BUFFER ADDRESSES WILL BE CHECKED AGAINST
                                ;* THE RECEIVE/TRANSMIT TABLE.
                                ;*
                                ;*      THE BUFFERS ARE DETERMINED IN THE SUBROUTINE $BUFFS.  THIS
                                ;*      SUBROUTINE WILL DETERMINE THE ADDRESS AND CHARACTER COUNT OF
                                ;*      64 RECEIVE AND 64 TRANSMIT BUFFERS.  THE ROUTINE WILL
                                ;*      ATTEMPT TO USE AS LARGE BUFFERS AS POSSIBLE IN THE FOLLOWING
                                ;*      HIERARCHY:
                                ;*              A. IF THERE IS MEMORY MANAGEMENT, USE A PAGE ABOVE 32K.
                                ;*              B. IF THERE IS FREE MEMORY ABOVE THE SUPERVISOR GREATER
                                ;*                 THAN 2K BYTES, USE THAT MEMORY
                                ;*              C. IF NEITHER OF THE PRECEEDING TWO ARE POSSIBLE, USE
                                ;*                 THE 2K BYTE DEFAULT BUFFER WITHIN THIS DIAGNOSTIC.
                                ;*
                                ;*******************************************************************
036474                          BGNTST
036474                                                                          T17::
036474  012737  000100  002324          MOV     #64.,BUFNUM     ;# OF RCV & XMIT BUFFERS.

036502  005037  002274                  CLR     RESUME          ;FLAG CLEARED IN ORDER NOT TO USE RESUME.
036506  005037  002276                  CLR     DMCMDE          ;FLAG CLEARED TO ALLOW DMR MODE.
036512  005037  002300                  CLR     MNTMDE          ;FLAG NOT TO REQUEST MAINTENANCE MODE.

036516                                  CALL    $BUFFS          ;DETERMINE 64 RCV &  64 XMIT BUFFERS

036522                                  CLEAR                   ;MASTER CLEAR
                                                                ;**** MACRO EXPANSION ****
036522  004737  011066                  JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                                ;****                   ****

036526                                  ESCAPE  TST             ;IF ERROR, EXIT TEST
036526  104410                                                                          TRAP    C$ESCAPE
036530  000012                                                                          .WORD   L10077-.

036532                                  CALL    $INOUT          ;THIS ROUTINE WILL MANAGE ALL THE DMR
                                                                ;COMMANDS ISSUED IN THE INTERRUPT ROUTINES
                                                                ;(FROM BASE IN UNTIL SHUT DOWN).  BESIDES
                                                                ;CONTROLLING THE SOFTWARE TIMEOUT, THIS
                                                                ;ROUTINE WILL ALSO CHECK THAT BUFFER
                                                                ;CHARACTER COUNTS AND ADDRESSES ARE CORRECT
                                                                ;AND THAT THE DATA IS CORRECT IN THOSE BUFFERS

036536                                  CALL    $ERROR          ;CHECK BASE TABLE FOR SOFT ERRORS


036542                          ENDTST
036542                                                                          L10077:
036542  104401                                                                          TRAP    C$ETST
```

```
                                .SBTTL          TEST 18 - DMR MODE LARGE MESSAGE

                                ;*******************************************************************
                                ;*              TEST  18 - DMR-11
                                ;* LARGE MESSAGE
                                ;* IN THIS MODE TRANSMIT AND RECEIVE 1 LARGE BUFFER
                                ;*
                                ;* THE BA/CC OUT RECEIVE AND TRANSMIT WILL BE ACCOUNTED FOR AND
                                ;* THE CHARACTER COUNTS AND BUFFER ADDRESSES WILL BE CHECKED AGAINST
                                ;* THE RECEIVE/TRANSMIT TABLE.
                                ;*
                                ;*      THE BUFFERS ARE DETERMINED IN THE SUBROUTINE $BUFFS.  THIS
                                ;*      SUBROUTINE WILL DETERMINE THE ADDRESS AND CHARACTER COUNT OF
                                ;*      ONE RECEIVE AND ONE TRANSMIT BUFFER.  THE ROUTINE WILL
                                ;*      ATTEMPT TO USE AS LARGE BUFFERS AS POSSIBLE IN THE FOLLOWING
                                ;*      HIERARCHY:
                                ;*              A. IF THERE IS MEMORY MANAGEMENT, USE A PAGE ABOVE 32K.
                                ;*              B. IF THERE IS FREE MEMORY ABOVE THE SUPERVISOR GREATER
                                ;*                 THAN 2K BYTES, USE THAT MEMORY
                                ;*              C. IF NEITHER OF THE PRECEEDING TWO ARE POSSIBLE, USE
                                ;*                 THE 2K BYTE DEFAULT BUFFER WITHIN THIS DIAGNOSTIC.
                                ;*
                                ;*******************************************************************
036544                          BGNTST
036544                                                                                  T18::

036544  012737  000001  002324          MOV     #1,BUFNUM       ;# OF RCV & XMIT BUFFERS.

036552  005037  002274                  CLR     RESUME          ;FLAG CLEARED IN ORDER NOT TO USE RESUME.
036556  005037  002276                  CLR     DMCMDE          ;FLAG CLEARED TO ALLOW DMR MODE.
036562  005037  002300                  CLR     MNTMDE          ;FLAG NOT TO REQUEST MAINTENANCE MODE.

036566                                  CALL    $BUFFS          ;DETERMINE 1 RCV &  1 XMIT BUFFER

036572                                  CLEAR                   ;MASTER CLEAR
                                                                ;**** MACRO EXPANSION ****
036572  004737  011066                  JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                                ;****                   ****

036576                                  ESCAPE  TST             ;IF ERROR, EXIT TEST
036576  104410                                                                          TRAP    C$[illegible]E
036600  000012                                                                          .WORD   L10100-.

036602                                  CALL    $INOUT          ;THIS ROUTINE WILL MANAGE ALL THE DMR
                                                                ;COMMANDS ISSUED IN THE INTERRUPT ROUTINES
                                                                ;(FROM BASE IN UNTIL SHUT DOWN).  BESIDES
                                                                ;CONTROLLING THE SOFTWARE TIMEOUT, THIS
                                                                ;ROUTINE WILL ALSO CHECK THAT BUFFER
                                                                ;CHARACTER COUNTS AND ADDRESSES ARE CORRECT
                                                                ;AND THAT THE DATA IS CORRECT IN THOSE BUFFERS

036606                                  CALL    $ERROR          ;CHECK BASE TABLE FOR SOFT ERRORS
                                                                ;NOTE: NORMALLY ANY NON-ZERO ERROR COUNT IS
                                                                ;REPORTED; HOWEVER IN THIS TEST A REP COUNT
                                                                ;OF 1 IS ALLOWED, BECAUSE AT LOW BAUD RATES
                                                                ;WE WOULD EXPECT 1 REP.
```

```
     52
     53 036612                          ENDTST
        036612                                                          L10100:
        036612  1044C'                                                          TRAP    C$ETST
     54
```

```
                                .SBTTL          TEST 19 - DMR MAINTENANCE MODE MESSAGE

                                ;*****************************************************************
                                ;*              TEST 19 - DMR-11
                                ;* MAINTENANCE MODE OPERATION
                                ;*
                                ;* THE BA/CC OUT RECEIVE AND TRANSMIT WILL BE ACCOUNTED FOR AND
                                ;* THE CHARACTER COUNTS AND BUFFER ADDRESSES WILL BE CHECKED AGAINST
                                ;* THE RECEIVE/TRANSMIT TABLE.
                                ;*
                                ;*      THE BUFFERS ARE DETERMINED IN THE SUBROUTINE $BUFFS.  THIS
                                ;*      SUBROUTINE WILL DETERMINE THE ADDRESS AND CHARACTER COUNT OF
                                ;*      ONE RECEIVE AND ONE TRANSMIT BUFFER.  THE ROUTINE WILL
                                ;*      ATTEMPT TO USE AS LARGE BUFFERS AS POSSIBLE IN THE FOLLOWING
                                ;*      HIERARCHY:
                                ;*              A. IF THERE IS MEMORY MANAGEMENT, USE A PAGE ABOVE 32K.
                                ;*              B. IF THERE IS FREE MEMORY ABOVE THE SUPERVISOR GREATER
                                ;*                 THAN 2K BYTES, USE THAT MEMORY
                                ;*              C. IF NEITHER OF THE PRECEEDING TWO ARE POSSIBLE, USE
                                ;*                 THE 2K BYTE DEFAULT BUFFER WITHIN THIS DIAGNOSTIC.
                                ;*
                                ;*****************************************************************
036614                          BGNTST
036614                                                                          T19::
036614  012737  000001  002324          MOV     #1,BUFNUM       ;# OF RCV & XMIT BUFFERS.

036622  005037  002274                  CLR     RESUME          ;DON'T ALLOW RESUME
036626  005037  002276                  CLR     DMCMDE          ;FLAG CLEARED TO ALLOW DMR MODE.
036632  012737  000001  002300          MOV     #1,MNTMDE       ;FLAG SET TO REQUEST MAINTENANCE MODE.

036640                                  CALL    $BUFFS          ;DETERMINE 1 RCV &  1 XMIT BUFFER

036644                                  CLEAR                   ;MASTER CLEAR
                                                                ;**** MACRO EXPANSION ****
036644  004737  011066                  JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                                ;****                   ****

036650                                  ESCAPE  TST             ;IF ERROR, EXIT TEST
036650  104410                                                                  TRAP    C$ESCAPE
036652  000012                                                                  .WORD   L10101-.

036654                                  CALL    $INOUT          ;THIS ROUTINE WILL MANAGE ALL THE DMR
                                                                ;COMMANDS ISSUED IN THE INTERRUPT ROUTINES
                                                                ;(FROM BASE IN UNTIL SHUT DOWN).  BESIDES
                                                                ;CONTROLLING THE SOFTWARE TIMEOUT, THIS
                                                                ;ROUTINE WILL ALSO CHECK THAT BUFFER
                                                                ;CHARACTER COUNTS AND ADDRESSES ARE CORRECT
                                                                ;AND THAT THE DATA IS CORRECT IN THOSE BUFFERS

036660                                  CALL    $ERROR          ;CHECK BASE TABLE FOR SOFT ERRORS


036664                          ENDTST
036664                                                                          L10101:
036664  104401                                                                  TRAP    C$ETST
```

```
                                        .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.
                                        ;*****************************************************************

 036666                                         BGNHRD
 036666  000015                                                                                 .WORD L10102-L$HARD/2
 036670                                                                                 L$HARD::

 036670                                         GPRMA   P1,2,0,160000,177776,YES
 036670  001031                                                                                 .WORD   T$CODE
 036672  036722                                                                                 .WORD   P1
 036674  160000                                                                                 .WORD   T$LOLIM
 036676  177776                                                                                 .WORD   T$HILIM
 036700                                         GPRMA   P2,4,0,0,776,YES
 036700  002031                                                                                 .WORD   T$CODE
 036702  036740                                                                                 .WORD   P2
 036704  000000                                                                                 .WORD   T$LOLIM
 036706  000776                                                                                 .WORD   T$HILIM
 036710                                         GPRMD   P3,20,0,7,0,7,YES
 036710  010032                                                                                 .WORD   T$CODE
 036712  036761                                                                                 .WORD   P3
 036714  000007                                                                                 .WORD   7
 036716  000000                                                                                 .WORD   T$LOLIM
 036720  000007                                                                                 .WORD   T$HILIM

                                                 ENDHRD
                                                                                                .EVEN
 036722                                                                                 L10102:

 036722     103     123     122  P1:     .ASCIZ  /CSR ADDRESS: /
 036725     040     101     104
 036730     104     122     105
 036733     123     123     072
 036736     040     000
 036740     126     105     103  P2:     .ASCIZ  /VECTOR ADDRESS: /
 036743     124     117     122
 036746     040     101     104
 036751     104     122     105
 036754     123     123     072
 036757     040     000
 036761     124     105     123  P3:     .ASCII  /TEST CONFIGURATION -/<CR><LF>
 036764     124     040     103
 036767     117     116     106
 036772     111     107     125
 036775     122     101     124
 037000     111     117     116
 037003     040     055     015
 037006     012
 037007     040     040     060          .ASCII  /  0 = INTERNAL (NO CONNECTOR)/<CR><LF>
```

```
        037012    040    075    040
        037015    111    116    124
        037020    105    122    116
        037023    101    114    040
        037026    050    116    117
        037031    040    103    117
        037034    116    116    105
        037037    103    124    117
        037042    122    051    015
        037045    012
     25 037046    040    040    061          .ASCII  /  1 = H3254 - V.35      (NOTE:  MODE 1-4 ALLOWS/<CR><LF>
        037051    040    075    040
        037054    110    063    062
        037057    065    064    040
        037062    055    040    126
        037065    056    063    065
        037070    040    040    040
        037073    040    040    040
        037076    050    116    117
        037101    124    105    072
        037104    040    040    115
        037107    117    104    105
        037112    040    061    055
        037115    064    040    101
        037120    114    114    117
        037123    127    123    015
        037126    012
     26 037127    040    040    062          .ASCII  /  2 = H3254 - INTEGRAL   PROGRAM INTERFACE SELECTION)/
        037132    040    075    040
        037135    110    063    062
        037140    065    064    040
        037143    055    040    111
        037146    116    124    105
        037151    107    122    101
        037154    114    040    040
        037157    040    120    122
        037162    117    107    122
        037165    101    115    040
        037170    111    116    124
        037173    105    122    106
        037176    101    103    105
        037201    040    123    105
        037204    114    105    103
        037207    124    111    117
        037212    116    051
     27 037214    015    012    040          .ASCII  <CR><LF>/  3 = H3255 - RS232C/<57>/423/<CR><LF>
        037217    040    063    040
        037222    075    040    110
        037225    063    062    065
        037230    065    040    055
        037233    040    122    123
        037236    062    063    062
        037241    103    057    064
        037244    062    063    015
        037247    012
     28
     29 037250    040    040    064          .ASCII  /  4 = H3255 - RS422/<CR><LF>
```

```
        037253     040     075     040
        037256     110     063     062
        037261     065     065     040
        037264     055     040     122
        037267     123     064     062
        037272     062     015     012
     30 037275     040     040     065          .ASCII  /  5 = CABLE AND SW PACK INTERFACE SELECTED/<CR><LF>
        037300     040     075     040
        037303     103     101     102
        037306     114     105     040
        037311     101     116     104
        037314     040     123     127
        037317     040     120     101
        037322     103     113     040
        037325     111     116     124
        037330     105     122     106
        037333     101     103     105
        037336     040     123     105
        037341     114     105     103
        037344     124     105     104
        037347     015     012
     31 037351     040     040     040          .ASCII  /      (V.35-H3250, INTEGRAL-BC55A-16,/
        037354     040     040     040
        037357     050     126     056
        037362     063     065     055
        037365     110     063     062
        037370     065     060     054
        037373     040     111     116
        037376     124     105     107
        037401     122     101     114
        037404     055     102     103
        037407     065     065     101
        037412     055     061     060
        037415     054
     32 037416     040     122     123          .ASCII  / RS232C-H325, RS423/<57>/422-H3251)/<CR><LF>
        037421     062     063     062
        037424     103     055     110
        037427     063     062     065
        037432     054     040     122
        037435     123     064     062
        037440     063     057     064
        037443     062     062     055
        037446     110     063     062
        037451     065     061     051
        037454     015     012
     33 037456     052     040     123          .ASCII  /* SELECT THE FOLLOWING ONLY IF THE MODEM SUPPORTS LOOPBACK */
        037461     105     114     105
        037464     103     124     040
        037467     124     110     105
        037472     040     106     117
        037475     114     114     117
        037500     127     111     116
        037503     107     040     117
        037506     116     114     131
        037511     040     111     106
        037514     040     124     110
        037517     105     040     115
```

```
        037522     117     104     105
        037525     115     040     123
        037530     125     120     120
        037533     117     122     124
        037536     123     040     114
        037541     117     117     120
        037544     102     101     103
        037547     113     040     052
    34  037552     015     012     040          .ASCII  <CR><LF>/  6 = LOCAL LOOP/<CR><LF>
        037555     040     066     040
        037560     075     040     114
        037563     117     103     101
        037566     114     040     114
        037571     117     117     120
        037574     015     012
    35  037576     040     040     067          .ASCIZ  /  7 = REMOTE LOOP/<CR><LF>
        037601     040     075     040
        037604     122     105     115
        037607     117     124     105
        037612     040     114     117
        037615     117     120     015
        037620     012     000
    36                                          .EVEN
    37
```

```
                                .SBTTL  SOFTWARE PARAMETER CODING SECTION


                                ;*********************************************************************
                                ;  THE SOFTWARE 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.
                                ;*********************************************************************

 037622                                 BGNSFT
 037622  000005                                                                    .WORD L10103-L$SOFT/2
 037624                                                                   L$SOFT::

 037624                                 GPRMD   S1,0,0,7,1,5,YES
 037624  000032                                                                    .WORD   T$CODE
 037626  037636                                                                    .WORD   S1
 037630  000007                                                                    .WORD   7
 037632  000001                                                                    .WORD   T$LOLIM
 037634  000005                                                                    .WORD   T$HILIM

 037636                                 ENDSFT
                                                                                   .EVEN
 037636                                                                   L10103:

 037636     123     105     114  S1:     .ASCII  /SELECTABLE PROGRAM LOOP TIME-OUT VARIABLE/<CR><LF>
 037641     105     103     124
 037644     101     102     114
 037647     105     040     120
 037652     122     117     107
 037655     122     101     115
 037660     040     114     117
 037663     117     120     040
 037666     124     111     115
 037671     105     055     117
 037674     125     124     040
 037677     126     101     122
 037702     111     101     102
 037705     114     105     015
 037710     012
 037711     133     122     105          .ASCIZ  /[REFER TO LISTING 6.3.13]   (MAX=5; MIN=1) /
 037714     106     105     122
 037717     040     124     117
 037722     040     114     111
 037725     123     124     111
 037730     116     107     040
 037733     066     056     063
 037736     056     061     063
 037741     135     040     040
 037744     040     050     115
 037747     101     130     075
 037752     065     073     040
 037755     115     111     116
 037760     075     061     051
 037763     040     000
```

```
                                        .EVEN

                                ;******************      PATCH AREA     ******************************
 037766                         PATCH:
          040066                        .=.+100
 040066   000240                        NOP
 040070   000240                        NOP
 040072   000240                        NOP
                                ;*********************************************************************
 040074                         ENDMOD

 040074                                 LASTAD
                                                                                        .EVEN
 040074   000000                                                                        .WORD   0
 040076   000000                                                                        .WORD   0
 040100                         L$LAST::
          000001                .END
```

SYMBOL TABLE

```
A      = 000044          C$AUTO= 000061          DMR    = 000522          ERRT1   026116 G          FRSTIM  002264
ADR    = 000020 G        C$BRK = 000022          DMRFLG  002260          ERRT2   031136 G          F$AU   = 000015
ASSEMB= 000010           C$BSEG= 000004          DMRRUN= 000040          ERRT3   027230 G          F$AUTO= 000020
AX3      002304          C$BSUB= 000002          DMRVEC  002226          ERRT4   031732 G          F$BGN = 000040
BACCR = 000004           C$CEFG= 000045          DMTURN  002254          EVL    = 000004 G         F$CLEA= 000007
BACCT = 000000           C$CLCK= 000062          DMTVEC  002230          EXERR = 000006            F$DU   = 000016
BASE     002636          C$CLEA= 000012          DTR    = 000100          E$END = 002100            F$END = 000041
BASEI = 000003           C$CLOS= 000035          DXERR = 000007          E$LOAD= 000035            F$HARD= 000004
BASEUP= 020000           C$CLP1= 000006          EF.CON= 000036 G        FINIT1  021500            F$HW   = 000013
BIGBUF   004236          C$CVEC= 000036          EF.NEW= 000035 G        FINIT2  021567            F$INIT= 000006
BIT0   = 000001 G        C$DCLN= 000044          EF.PWR= 000034 G        FINIT3  021656            F$JMP = 000050
BIT00 = 000001 G         C$DODU= 000051          EF.RES= 000037 G        FLAG    002342            F$MOD = 000000
BIT01 = 000002 G         C$DRPT= 000024          EF.STA= 000040 G        FMDROP  023632            F$MSG = 000011
BIT02 = 000004 G         C$DU   = 000053         EMG1    017704          FMG1    016270            F$PROT= 000021
BIT03 = 000010 G         C$EDIT= 000003          EMG10   020055          FMG10   016703            F$PWR = 000017
BIT04 = 000020 G         C$ERDF= 000055          EMG11   020104          FMG11   016741            F$RPT = 000012
BIT05 = 000040 G         C$ERHR= 000056          EMG12   020127          FMG12   016773            F$SEG = 000003
BIT06 = 000100 G         C$ERRO= 000060          EMG13   020155          FMG13   017024            F$SOFT= 000005
BIT07 = 000200 G         C$ERSF= 000054          EMG14   020203          FMG14   017100            F$SRV = 000010
BIT08 = 000400 G         C$ERSO= 000057          EMG15   020223          FMG15   017154            F$SUB = 000002
BIT09 = 001000 G         C$ESCA= 000010          EMG16   020236          FMG16   017203            F$SW   = 000014
BIT1   = 000002 G        C$ESEG= 000005          EMG17   020267          FMG17   017262            F$TEST= 000001
BIT10 = 002000 G         C$ESUB= 000003          EMG18   020341          FMG18   017335            GETPRM  020616
BIT11 = 004000 G         C$ETST= 000001          EMG19   020370          FMG19   017424            G$CNTO= 000200
BIT12 = 010000 G         C$EXIT= 000032          EMG2    017715          FMG2    016322            G$DELM= 000372
BIT13 = 020000 G         C$GETB= 000026          EMG8    017762          FMG21   017447            G$DISP= 000003
BIT14 = 040000 G         C$GETW= 000027          EMG9    020026          FMG22   017515            G$EXCP= 000400
BIT15 = 100000 G         C$GMAN= 000043          EMS3    012526          FMG23   017542            G$HILI= 000002
BIT2   = 000004 G        C$GPHR= 000042          EMS4    012712          FMG24   017623            G$LOLI= 000001
BIT3   = 000010 G        C$GPLO= 000030          EMT0    024062          FMG3    016354            G$NO   = 000000
BIT4   = 000020 G        C$GPRI= 000040          EMT1    025434          FMG4    016426            G$OFFS= 000400
BIT5   = 000040 G        C$INIT= 000011          EMT10   030546          FMG5    016457            G$OFSI= 000376
BIT6   = 000100 G        C$INLP= 000020          EMT11   030574          FMG7    016510            G$PRMA= 000001
BIT7   = 000200 G        C$MANI= 000050          EMT12   030630          FMG8    016561            G$PRMD= 000002
BIT8   = 000400 G        C$MEM  = 000031         EMT13   031170          FMG9    016632            G$PRML= 000000
BIT9   = 001000 G        C$MSG  = 000023         EMT2    025454          FMS1    010616            G$RADA= 000140
BOE    = 000400 G        C$OPEN= 000034          EMT20   031770          FMS2    010651            G$RADB= 000000
BSEL0 = 002232           C$PNTB= 000014          EMT22   036202          FMS3    011744            G$RADD= 000040
BSEL1    002242          C$PNTF= 000017          EMT3    025610          FMT0    024111            G$RADL= 000120
BSEL2 = 002234           C$PNTS= 000016          EMT4    026336          FMT1    025146            G$RADO= 000020
BSEL3    002244          C$PNTX= 000015          EMT5    026363          FMT11   027624            G$XFER= 000004
BSEL4 = 002236           C$QIO  = 000377         EMT6    026431          FMT12   027655            G$YES  = 000010
BSEL5    002246          C$RDBU= 000007          EMT7    027536          FMT13   027712            HALTC  = 001000
BSEL6 = 002240           C$REFG= 000047          EMT8    027567          FMT14   027747            HDX    = 002000
BSEL7    002250          C$RESE= 000033          EMT9    030516          FMT15   030004            HELP   = 000000
BUFNUM   002324          C$REVI= 000003          END     021476          FMT16   030041            HICRC    002402
BUFSIZ   002322          C$RFLA= 000021          ERRFLG  002360          FMT19   031214            HIWORD   002406
CD     = 002000          C$RPT  = 000025         ERRG1   014604 G        FMT2    025215            HLT    = 000002
CHIPNO   002412          C$SEFG= 000046          ERRG10  016152 G        FMT25   036240            HOE    = 100000 G
CLRNO    002376          C$SPRI= 000041          ERRG11  016204 G        FMT3    025272            IBE    = 010000 G
CMD    = 000007          C$SVEC= 000037          ERRG12  016236 G        FMT4    025356            IDU    = 000040 G
CNTRL = 000001           C$TPRI= 000013          ERRG2   015112 G        FMT5    026470            IECLR = 000020
COUNT    002414          DDMC   = 000010         ERRG3   015226 G        FMT6    026521            IEO    = 000100
CR     = 000015          DFPTBL  002174 G        ERRG4   015456 G        FMT7    026552            IER    = 020000 G
CSR      002232          DIAGMC= 000000          ERRG7   015752 G        FMT8    026603            IESET = 000100
CTS    = 010000          DISCON= 000100          ERRG8   016050 G        FMT9    026634            INFACE   002262
C$AU   = 000052          DMCMDE  002276          ERROR   002364          FRSPAS  002266            INFLAG   002352
```

SYMBOL TABLE

```
INISR   022052 G     L$ETP   002102 G     L10033  025764     NOBFR = 000004     RUN   = 100000
INRCV   002326       L$EXP1  002046 G     L10034  026112     NOXMEM  023572 G   SAVE    002340
INTER = 000015       L$EXP4  002064 G     L10035  026334     NXM   = 000400     SECN  = 004000
INXMIT  002330       L$EXP5  002066 G     L10036  027226     NXMFLG  002350     SEL0  = 002232
ISP13 = 000076       L$HARD  036670 G     L10037  027046     OUTFLG  002354     SEL2    002234
ISP7  = 000072       L$HIME  002120 G     L10040  027224     OUTISR  023134 G   SEL4    002236
ISR   = 000100 G     L$HPCP  002016 G     L10041  027534     OUTRCV  002332     SEL6    002240
IXE   = 004000 G     L$HPTP  002022 G     L10042  030514     OUTXMT  002334     SFLAG   002344
I$AU  = 000041       L$HW    002174 G     L10043  030232     O$APTS= 000000     SFPTBL  002224 G
I$AUTO= 000041       L$ICP   002104 G     L10044  030322     O$AU  = 000000     SKIP    002346
I$CLN = 000041       L$INIT  020440 G     L10045  030416     O$BGNR= 000000     SPEED   002224
I$DU  = 000041       L$LADP  002026 G     L10046  030512     O$BGNS= 000001     STARES  002270
I$HRD = 000041       L$LAST  040100 G     L10047  031122     O$DU  = 000001     STARST  020574
I$INIT= 000041       L$LOAD  002100 G     L10050  031022     O$ERRT= 000000     START   002272
I$MOD = 000041       L$LUN   002074 G     L10051  031120     O$GNSW= 000001     STLU  = 010000
I$MSG = 000041       L$MREV  002050 G     L10052  031166     O$POIN= 000001     STREC = 000200
I$PROT= 000040       L$NAME  002000 G     L10053  031730     O$SETU= 000000     STUP  = 000400
I$PTAB= 000041       L$PRIO  002042 G     L10054  031522     PATCH   037766     SUBRPC  002372
I$PWR = 000041       L$PROT  020432 G     L10055  031726     PNT   = 001000 G   SVCGBL= 000000
I$RPT = 000041       L$PRT   002112 G     L10056  031766     PRETIM= 000055     SVCINS= 000001
I$SEG = 000041       L$REPP  002062 G     L10057  032514     PRI   = 002000 G   SVCSUB= 000001
I$SETU= 000041       L$REV   002010 G     L10060  032146     PRI00 = 000000 G   SVCTAG= 000001
I$SFT = 000041       L$SOFT  037624 G     L10061  032326     PRI01 = 000040 G   SVCTST= 000001
I$SRV = 000041       L$SPC   002056 G     L10062  032512     PRI02 = 000100 G   SW00  = 000001
I$SUB = 000041       L$SPCP  002020 G     L10063  032740     PRI03 = 000140 G   SW01  = 000002
I$TST = 000041       L$SPTP  002024 G     L10064  033120     PRI04 = 000200 G   SW02  = 000004
J$JMP = 000167       L$STA   002030 G     L10065  034024     PRI05 = 000240 G   SW03  = 000010
LAST    002362       L$SW    002224 G     L10066  033250     PRI06 = 000300 G   SW04  = 000020
LF    = 000012       L$TEST  002114 G     L10067  033366     PRI07 = 000340 G   SW05  = 000040
LLOOP = 000006       L$TIML  002014 G     L10070  033504     PSTACK  002370     SW06  = 000100
LOCATE  024004 G     L$UNIT  002012 G     L10071  033662     P1      036722     SW07  = 000200
LOCRC   002400       L10000  002222       L10072  034022     P2      036740     SW08  = 000400
LOE   = 040000 G     L10001  002226       L10073  034554     P3      036761     SW09  = 001000
LOGDEV  002366       L10002  015110       L10074  036200     R     = 000042     SW10  = 002000
LOT   = 000010 G     L10003  015224       L10075  036424     RBUF    002570     SW11  = 004000
LOWORD  002404       L10004  015454       L10076  036472     RCOUNT= 000044     SW12  = 010000
LPLU  = 004000       L10005  015750       L10077  036542     RCV   = 000004     SW13  = 020000
L$ACP   002110 G     L10006  016046       L10100  036612     RCVBUF  003636     SW14  = 040000
L$APT   002036 G     L10007  016150       L10101  036664     RDI   = 000200     SW15  = 100000
L$AUT   002070 G     L10010  016202       L10102  036722     RDO   = 000200     S$LSYM= 010000
L$AUTO  021744 G     L10011  016234       L10103  037636     RES   = 010000     S1      037636
L$CCP   002106 G     L10012  016266       MAINT = 000400     RESFLG  002356     T     = 000045
L$CLEA  022034 G     L10014  021476       MAINT1= 000010     RESUME  002274     TBUF    002520
L$CO    002032 G     L10015  022032       MAINT2= 000004     RETURN= 000207     TCOUNT= 000044
L$DEPO  002011 G     L10016  022050       MANUF   002310     REV1    025502     TEMP    002336
L$DESC  010244 G     L10017  023132       MCLR  = 040000     REV2    025504     TFLAG   002516
L$DESP  002076 G     L10020  023570       MDIAG = 020000     RFLAG   002566     THRESH= 000013
L$DEVP  002060 G     L10021  023600       MICRO   002256     RLOOP = 000007     TH1L  = 000060
L$DISP  002124 G     L10022  023630       MMANAG  002302     RMODEM= 000017     TH2L  = 000062
L$DLY   002116 G     L10023  024002       MNTMDE  002300     ROMADR  002410     TH3L  = 000064
L$DTP   002040 G     L10024  024060       MNTREC= 000010     ROMI  = 001000     TH4L  = 000066
L$DTYP  002034 G     L10025  025144       MODEM   031124     ROMLOC  025473     TIMER = 000012
L$DU    023602 G     L10026  024346       N     = 000043     ROMO  = 002000     TOLONG= 000020
L$DUT   002072 G     L10027  024770       NAKS  = 000001     RQI   = 000040     TOUT  = 000002
L$DVTY  010236 G     L10030  025142       NESTPC  002374     RRAM  = 000014     TSEL4   035342
L$EF    002052 G     L10031  025606       NEWST   020600     RSEL4   035324     TSEL6   035344
L$ENVI  002044 G     L10032  026114       NEXT    022606     RSEL6   035326     T$ARGC= 000002
```

SYMBOL TABLE

```
T$CODE= 000032          T$TSTM= 177777          T12.4   033506          T6.2    030234          X      = 000046
T$ERRN= 000023          T$TSTS= 000001          T12.5   033664          T6.3    030324          XMTBUF  003236
T$EXCP= 000000          T$$AUT= 010015          T13     034026 G        T6.4    030420          X$ALWA= 000000
T$FLAG= 000040          T$$CLE= 010016          T14     034556 G        T7      030660 G        X$FALS= 000040
T$GMAN= 000000          T$$DU = 010022          T15     036322 G        T7.1    030660          X$OFFS= 000400
T$HILI= 000005          T$$HAR= 010102          T16     036426 G        T7.2    031024          X$TRUE= 000020
T$LAST= 000001          T$$HW = 010000          T17     036474 G        T8      031302 G        $BACC   012270
T$LOLI= 000001          T$$INI= 010014          T18     036544 G        T8.1    031302          $BASEI  011264
T$LSYM= 010000          T$$MSG= 010056          T19     036614 G        T8.2    031524          $BUFFS  013174
T$LTNO= 000023          T$$PRO= 010013          T2      024172 G        T9      032004 G        $CCITT  002416
T$NEST= 177777          T$$SOF= 010103          T2.1    024172          T9.1    032004          $CLRQI  010704
T$NS0 = 000000          T$$SRV= 010024          T2.2    024350          T9.2    032150          $CNTIN  011520
T$NS1 = 000005          T$$SUB= 010072          T2.3    024772          T9.3    032330          $DMRIN  012060
T$NS2 = 000002          T$$SW = 010001          T3      025506 G        JAM   = 000200 G        $ERROR  012402
T$PTNU= 000000          T$$TES= 010101          T4      025640 G        UPDATE= 000011          $HALT   012550
T$SAVL= 177777          T1      023662 G        T4.1    025640          WAIT1   002312          $INOUT  014126
T$SEGL= 177777          T10     032516 G        T4.2    025766          WAIT2   002314          $LOOP   013052
T$SUBN= 000000          T11     032742 G        T5      026666 G        WAIT3   002316          $LSTIN= 000001
T$TAGL= 177777          T12     033122 G        T5.1    026666          WAIT4   002320          $LSTTA= 000001
T$TAGN= 010104          T12.1   033122          T5.2    027050          WMAINT  002306          $MSCLR  011066
T$TEMP= 000000          T12.2   033252          T6      030100 G        WMODEM= 000005          $ROMO   012732
T$TEST= 000023          T12.3   033370          T6.1    030100          WTYPE   002252          $WAIT   010274

. ABS.  040100     000
        000000     001
ERRORS DETECTED:  0

VIRTUAL MEMORY USED:  23264 WORDS  ( 91 PAGES)
DYNAMIC MEMORY AVAILABLE FOR  69 PAGES
CZDMIC.BIN,DB2:CZDMIC.SEQ/C/N:TOC=#SVC34R.MLB,CZDMIC.P11
```

$BACC	34-29#	60-36	60-82	61-57	61-59	61-86	61-93	62-34	64-19	64-24	65-77	65-101	65-107	65-134
	67-45	67-49	68-124	68-130										
$BASEI	31-36#	56-23	56-56	57-22	57-36	57-55	58-25	58-48	58-67	58-93	59-21	60-19	60-67	61-18
	61-27	61-47	61-80	62-14	64-13	65-20	65-25	65-98	65-128	67-33	68-100	70-64		
$BUFFS	40-34#	70-56	71-52	72-31	73-32	74-30								
$CCITT	20-151#	40-75	40-154	68-62										
$CLRQI	29-29#	31-54	31-78	32-50	33-69	34-45	37-25	48-169	58-38	59-44	59-66			
$CNTIN	32-34#	58-28	58-50	58-70	58-102	60-22	60-70	61-50	61-83	62-27	64-16	65-53	67-42	68-109
$DMRIN	33-35#	39-41	41-111	57-25	57-38	57-58	57-67	59-29	59-54	60-31	60-79	62-21	62-24	62-32
$ERROR	35-25#	67-132	68-254	72-45	73-46	74-44								
$HALT	37-17#	41-115	56-26	56-59	57-28	57-41	57-70	58-39	58-59	58-73	59-67	60-59	60-96	61-21
	62-62	64-40	67-130	68-253	70-67									
$INOUT	41-22#	70-74	71-58	72-37	73-38	74-36								
$LOOP	39-22#	58-98	67-39	68-106										
$LSTIN	14-21#													
$LSTTA	14-22#													
$MSCLR	30-36#	54-30	54-39	56-19	56-51	57-18	57-51	58-22	58-64	58-83	59-18	60-16	60-64	61-15
	61-44	61-77	62-11	64-10	65-18	65-44	65-72	65-95	65-125	67-23	68-89	70-58	71-54	72-33
	73-34	74-32												
$ROMO	38-17#	53-42	53-81	53-85	53-167									
$WAIT	28-37#	31-42	31-74	32-39	32-54	33-48	34-35	37-23	37-27	41-[illegible]	58-33	58-54	59-36	59-58
	60-38	60-56	60-84	61-29	61-61	61-95	62-37	64-26	65-27	65-55	65-79	65-109	65-136	67-54
	68-136													
A	19-121#	56-39	56-72	56-95	56-97									
ADR	19-8#													
ASSEMB	14-15	14-15												
AX3	20-59#	31-76	45-121*	45-125*	45-130*	45-135*	45-140*	45-146*	48-44					
BACCR	19-93#	48-23	48-233	61-57	61-86	64-19	65-77	65-101	65-134	67-45	68-125			
BACCT	19-89#	48-25	48-253	60-36	60-82	61-59	61-93	62-34	64-24	65-107	67-49	68-131		
BASE	20-185#	35-34	42-69	42-71	42-74	42-74	42-76	42-78	42-81	42-81	42-83	42-85	42-88	42-88
	42-90	42-92	42-95	42-95	48-78	56-23	56-27	56-35	56-37	56-39	56-41	56-43	56-56	56-60
	56-68	56-70	56-72	56-74	56-76	56-86	56-88	56-90	56-92	56-95	56-97	56-99	56-101	56-103
	56-105	57-22	57-30	57-36	57-43	57-55	57-72	57-74	57-76	57-78	57-80	57-90	57-91	57-93
	57-95	57-97	57-99	57-101	57-103	57-105	57-107	57-109	58-25	58-41	58-48	58-67	58-75	58-95
	59-21	60-19	60-67	60-97	60-99	60-110	60-110	61-18	61-47	61-80	62-14	64-13	65-20	65-25
	65-98	65-128	67-35	68-102	70-64									
BASEI	19-92#	31-40	41-41	48-27	48-185	48-191								
BASEUP	19-57#													
BIGBUF	20-197#	40-125												
BIT0	19-8#	19-82	30-49	40-122	40-193	48-220	48-240	53-189	57-30	57-43				
BIT00	19-8	19-8#												
BIT01	19-8	19-8#												
BIT02	19-8	19-8#												
BIT03	19-8	19-8#												
BIT04	19-8	19-8#												
BIT05	19-8	19-8#												
BIT06	19-8	19-8#												
BIT07	19-8	19-8#												
BIT08	19-8	19-8#												
BIT09	19-8	19-8#												
BIT1	19-8#	19-81	58-75											
BIT10	19-8#	19-39	19-64	19-65										
BIT11	19-8#	19-38	19-62											
BIT12	19-8#	19-37	19-59	19-61										
BIT13	19-8#	19-36	19-57	48-136	48-146									
BIT14	19-8#	19-35	48-125	48-142	48-146	48-299	48-306	61-27	61-57	61-93	68-118	68-121	68-229	

BIT15	19-8#	19-34	48-306	61-27	61-57	61-93	68-226							
BIT2	19-8#	19-50	19-79	19-80										
BIT3	19-8#	19-77	19-78	45-130										
BIT4	19-8#	19-47	19-76	45-125	56-27	56-60	58-34	58-41	58-55	62-32				
BIT5	19-8#	19-46	19-75											
BIT6	19-8#	19-44	19-54	19-73	19-74	45-135								
BIT7	19-8#	19-43	19-53	19-72	45-140									
BIT8	19-8#	19-41	19-67	19-68	19-71									
BIT9	19-8#	19-40	19-66											
BOE	19-8#													
BSEL0	20-20#	31-40*	31-73*	32-37*	33-42*	34-32*	41-41*	48-202*	48-207*	48-213*	48-228*	48-233*	48-248*	48-253*
BSEL1	20-21#	45-58*	45-59*											
BSEL2	20-22#													
BSEL3	20-23#	30-42*	42-44	42-49	42-57	45-62*	45-63*	54-33	54-38	54-42				
BSEL4	20-24#													
BSEL5	20-25#	45-66*	45-67*											
BSEL6	20-26#	31-56	53-43	53-82	53-86	53-168	59-39	59-61	59-76					
BSEL7	20-27#	31-76*	45-70*	45-71*	48-44*	53-44	53-83	53-87	53-172					
BUFNUM	20-88#	40-96	40-101	40-131	40-133	40-174	40-185	41-26	41-27	41-28	41-29	41-67	42-12	42-18
	42-19	42-20	42-21	70-51*	71-47*	72-25*	73-26*	74-24*						
BUFSIZ	20-87#	40-98*	40-103*	40-106*	40-146*	40-147*	40-149*	40-177	40-178	40-189	40-191	42-13		
C$AU	14-15#													
C$AUTO	14-15#	46-28												
C$BRK	14-15#	28-59	29-46	30-70	41-45									
C$BSEG	14-15#													
C$BSUB	14-15#	53-33	53-59	53-162	56-18	56-50	57-17	57-50	58-21	58-47	58-63	58-81	59-17	59-52
	60-15	60-63	61-14	61-43	61-76	65-16	65-42	65-70	65-94	65-124				
C$CEFG	14-15#													
C$CLCK	14-15#													
C$CLEA	14-15#	47-16												
C$CLOS	14-15#													
C$CLP1	14-15#													
C$CVEC	14-15#	40-113	45-25	46-21	51-45	68-18	68-82	68-245						
C$DCLN	14-15#	46-25	51-42											
C$DODU	14-15#	46-24	51-41											
C$DRPT	14-15#													
C$DU	14-15#	49-13												
C$EDIT	14-15#	15-11												
C$ERDF	14-15#	28-67	28-78	29-52	30-76	32-61	32-66	37-31	37-36	41-59	41-81	41-96	48-37	48-272
	48-283	48-294	48-303	48-334	48-339	48-345	51-55	53-138	53-150	53-182	54-49	56-31	56-46	56-64
	56-79	57-33	57-46	57-83	58-36	58-43	58-57	58-77	59-42	59-64	60-47	60-52	60-88	60-93
	60-102	61-32	61-37	61-64	61-69	61-98	61-103	62-44	62-55	62-60	64-30	64-36	65-31	65-36
	65-59	65-64	65-83	65-88	65-113	65-118	65-140	65-145	67-58	67-68	67-74	67-79	67-87	67-93
	67-98	67-112	67-115	68-85	68-141	68-148	68-154	68-159	68-164	68-170	68-175	68-198	68-250	
C$ERHR	14-15#													
C$ERRO	14-15#													
C$ERSF	14-15#													
C$ERSO	14-15#	35-54												
C$ESCA	14-15#	54-32	54-41	56-21	56-25	56-53	56-58	57-20	57-24	57-27	57-29	57-40	57-42	57-53
	57-57	57-60	57-69	57-71	58-24	58-27	58-30	58-40	58-52	58-66	58-69	58-72	58-74	58-85
	58-97	58-101	59-20	59-23	59-33	59-37	59-45	59-56	59-59	60-18	60-21	60-24	60-33	60-39
	60-57	60-66	60-69	60-72	60-81	60-85	61-17	61-20	61-22	61-46	61-49	61-52	61-79	61-82
	61-85	61-88	62-13	62-23	62-26	62-29	62-36	62-38	64-12	64-15	64-18	64-27	65-28	65-56
	65-80	65-97	65-100	65-103	65-110	65-127	65-130	65-137	67-25	67-37	67-40	67-43	67-47	67-51
	68-91	68-104	68-107	68-110	68-128	68-134	68-137	70-60	70-66	70-68	71-56	72-35	73-36	74-34
C$ESEG	14-15#													
C$ESUB	14-15#	53-56	53-160	53-195	56-48	56-81	57-48	57-85	58-45	58-61	58-79	58-103	59-50	59-69

	60-61	60-105	61-41	61-74	61-107	65-40	65-68	65-92	65-122	65-149				
C$ETST	14-15#	51-47	53-197	54-51	56-83	57-86	58-107	59-71	60-106	61-109	62-65	64-44	65-151	67-134
	68-258	70-83	71-68	72-48	73-53	74-47								
C$EXIT	14-15#													
C$GETB	14-15#													
C$GETW	14-15#													
C$GMAN	14-15#													
C$GPHR	14-15#	45-48												
C$GPLO	14-15#													
C$GPRI	14-15#													
C$INIT	14-15#	45-171												
C$INLP	14-15#													
C$MANI	14-15#													
C$MEM	14-15#	40-114												
C$MSG	14-15#	42-24	42-34	42-61	42-97	42-105	42-111	42-116	42-120	42-126	56-107	57-111	59-77	60-111
C$OPEN	14-15#													
C$PNTB	14-15#	28-75	28-84	32-56	42-9	42-10	42-11	42-12	42-13	42-22	42-23	42-30	42-32	42-33
	42-39	42-41	42-46	42-51	42-54	42-59	42-67	42-74	42-81	42-88	42-95	42-102	42-103	42-104
	42-108	42-109	42-110	42-115	42-119	42-125	45-55	45-76	45-163	53-40	53-46	53-140	53-152	53-184
	54-35	56-88	56-92	56-97	56-101	56-105	57-89	57-90	57-93	57-97	57-101	57-105	57-109	59-76
	60-110	68-86	68-251											
C$PNTF	14-15#	49-11												
C$PNTS	14-15#													
C$PNTX	14-15#	51-58												
C$QIO	14-15#													
C$RDBU	14-15#													
C$REFG	14-15#	45-27	45-29	45-31	45-33									
C$RESE	14-15#	14-15#	49-10											
C$REVI	14-15#	15-11												
C$RFLA	14-15#													
C$RPT	14-15#													
C$SEFG	14-15#													
C$SPRI	14-15#	40-48	41-38	41-117	45-10	68-33								
C$SVEC	14-15#	40-38	45-93	45-94	46-10	51-21	68-15	68-58	68-235					
C$TPRI	14-15#													
CD	19-65#													
CHIPNO	20-135#													
CLKNO	20-125#	30-49	30-62*	45-16*										
CMD	19-110#	32-69	37-38	48-360	60-42	60-55	60-58	61-39	61-72	61-105	65-38	65-66	65-90	65-120
	65-147	67-121	68-202											
CNTRL	19-90#	28-73	28-76	31-67	32-37	32-59	37-29	48-29	48-213	48-275	60-45	60-86	61-23	61-30
	61-53	61-62	61-89	61-96	62-53	64-21	64-28	65-22	65-29	65-46	65-57	65-74	65-81	65-104
	65-111	65-131	65-138	67-56	68-139									
COUNT	20-136#	28-39*	28-60*	62-39										
CR	19-143#	75-23	75-24	75-25	75-27	75-27	75-29	75-30	75-32	75-34	75-34	75-35	76-19	
CSR	20-15#	20-19	20-20	45-57*	46-12	51-58								
CTS	19-61#													
DDMC	19-97#													
DFPTBL	17-10#													
DIAGMC	14-15	14-15												
DISCON	19-73#													
DMCMDE	20-54#	39-23	45-15*	48-80	48-156	48-188	70-53*	71-49*	72-28*	73-29*	74-27*			
DMR	19-68#	48-82	56-23	57-22	57-36	57-55	58-25	58-48	58-67	58-96	59-21	60-19	60-67	61-18
	61-27	61-47	61-80	62-14	64-13	65-20	65-25	65-98	65-128	67-36	68-103	70-64		
DMRFLG	20-41#	31-61*	31-64*	32-48*	32-51	32-53*	65-49*							
DMRRUN	19-75#	32-64	48-279											
DMRVEC	20-13#	45-78*	45-93											

DMTURN	20-33#	39-29	45-97*	45-123	45-128	45-133	45-138	45-152	45-154	45-157	45-159	48-54	48-97	58-86
	67-26	68-93												
DMTVEC	20-14#	45-79*	45-88*	45-94										
DTR	19-74#	48-57	48-61											
DXERR	19-96#	57-38												
ESEND	14-15#													
ESLOAD	14-15#	15-11												
EF.CON	19-8#	45-33												
EF.NEW	19-8#	45-31												
EF.PWR	19-8#													
EF.RES	19-8#	45-29												
EF.STA	19-8#	45-27												
EMG1	28-67	29-52	30-76	42-156#										
EMG10	42-160#	67-68	68-148											
EMG11	42-161#	48-303	48-334	48-345	67-74	67-93	68-154	68-170						
EMG12	41-81	42-162#	48-339	67-79	67-98	68-159	68-175							
EMG13	42-163#	67-87	68-164											
EMG14	42-164#	67-112												
EMG15	41-96	42-165#	67-115	68-198										
EMG16	42-166#	48-294												
EMG17	42-167#	48-37												
EMG18	42-168#	48-272												
EMG19	42-169#	62-44												
EMG2	41-59	42-157#												
EMG8	32-61	42-158#	60-47	60-88	61-32	61-64	61-98	62-55	64-30	65-31	65-59	65-83	65-113	65-140
EMG9	28-78	32-66	42-159#	48-283	60-52	60-93	61-37	61-69	61-103	62-60	64-36	65-36	65-64	65-88
	65-118	65-145	67-58	68-141										
EMS3	35-54	35-64#												
EMS4	37-31	37-36	37-43#											
EMT0	51-55	51-62#												
EMT1	53-138	53-150	53-203#											
EMT10	58-43	58-110#												
EMT11	58-57	58-111#												
EMT12	58-77	58-112#												
EMT13	59-42	59-64	59-80#											
EMT2	53-182	53-204#												
EMT20	60-102	60-113#												
EMT22	68-85	68-250	68-261#											
EMT3	54-49	54-53#												
EMT4	56-31	56-109#												
EMT5	56-46	56-79	56-110#											
EMT6	56-64	56-111#												
EMT7	57-33	57-46	57-114#											
EMT8	57-83	57-115#												
EMT9	58-36	58-109#												
END	45-35	45-167	45-170#											
ERRFLG	20-113#	28-38*	28-68*	28-79*	28-92	29-30*	29-53*	29-61						
ERRG1	41-59	42-8#												
ERRG10	41-81	42-114#												
ERRG11	42-118#													
ERRG12	41-96	42-122#												
ERRG2	28-67	28-78	29-52	32-61	32-66	37-31	37-36	42-27#	48-37	48-272	48-283	48-303	60-47	60-52
	60-88	60-93	61-32	61-37	61-64	61-69	61-98	61-103	62-55	62-60	64-30	64-36	65-31	65-36
	65-59	65-64	65-83	65-88	65-113	65-118	65-140	65-145	67-58	67-68	67-74	67-79	67-87	67-93
	67-98	67-112	67-115	68-141	68-148	68-154	68-159	68-164	68-170	68-175	68-198			
ERRG3	30-76	42-36#	54-49											
ERRG4	35-54	42-64#												

ERRG7	42-101#	48-345												
ERRG8	42-107#	48-334	48-339											
ERROR	20-119#	28-73	31-67	45-13*	61-23*	61-40*	61-53*	61-73*	61-89*	61-106*	64-21*	64-39*	65-22*	65-39*
	65-46*	65-67*	65-74*	65-91*	65-104*	65-121*	65-131*	65-148*						
ERRT1	56-46	56-79	56-85#											
ERRT2	59-42	59-64	59-75#											
ERRT3	57-83	57-88#												
ERRT4	60-102	60-109#												
EVL	19-8#													
EXERR	19-95#	57-25												
F$AU	14-15#													
F$AUTO	14-15#	46-8	46-28											
F$BGN	14-15#	14-18	42-8	42-27	42-36	42-64	42-101	42-107	42-114	42-118	42-122	44-8	45-8	46-8
	47-9	48-9	48-267	48-367	49-8	51-19	51-47	51-50	53-32	53-33	53-33	53-56	53-59	53-59
	53-160	53-162	53-162	53-195	53-197	54-29	54-32	54-41	54-51	56-17	56-18	56-18	56-21	56-25
	56-48	56-50	56-50	56-53	56-58	56-81	56-83	56-85	57-16	57-17	57-17	57-20	57-24	57-27
	57-29	57-40	57-42	57-48	57-50	57-50	57-53	57-57	57-60	57-69	57-71	57-85	57-86	57-88
	58-20	58-21	58-21	58-24	58-27	58-30	58-40	58-45	58-47	58-47	58-52	58-61	58-63	58-63
	58-66	58-69	58-72	58-74	58-79	58-81	58-81	58-85	58-97	58-101	58-103	58-107	59-15	59-17
	59-17	59-20	59-23	59-33	59-37	59-45	59-50	59-52	59-52	59-56	59-59	59-69	59-71	59-75
	60-14	60-15	60-15	60-18	60-21	60-24	60-33	60-39	60-57	60-61	60-63	60-63	60-66	60-69
	60-72	60-81	60-85	60-105	60-106	60-109	61-13	61-14	61-14	61-17	61-20	61-22	61-41	61-43
	61-43	61-46	61-49	61-52	61-74	61-76	61-76	61-79	61-82	61-85	61-88	61-107	61-109	62-10
	62-13	62-23	62-26	62-29	62-36	62-38	62-65	64-9	64-12	64-15	64-18	64-27	64-44	65-15
	65-16	65-16	65-28	65-40	65-42	65-42	65-56	65-68	65-70	65-70	65-80	65-92	65-94	65-94
	65-97	65-100	65-103	65-110	65-122	65-124	65-124	65-127	65-130	65-137	65-149	65-151	67-11	67-25
	67-37	67-40	67-43	67-47	67-51	67-134	68-12	68-91	68-104	68-107	68-110	68-128	68-134	68-137
	68-258	70-46	70-60	70-66	70-68	70-83	71-46	71-56	71-68	72-24	72-35	72-48	73-24	73-36
	73-53	74-23	74-34	74-47	75-13	76-13	76-30							
F$CLEA	14-15#	47-9	47-16											
F$DU	14-15#	49-8	49-13											
F$END	14-15	14-15	14-15	14-15	14-15	14-15	14-15	14-15	14-15	14-15	14-15	14-15	14-15	14-15
	14-15	14-15	14-15#	14-18	42-24	42-34	42-61	42-97	42-105	42-111	42-116	42-120	42-126	45-171
	46-28	47-16	48-262	48-362	48-371	49-13	51-19	51-19	51-19	51-47	51-47	51-60	53-32	53-32
	53-32	53-33	53-33	53-56	53-56	53-59	53-59	53-160	53-160	53-162	53-162	53-195	53-195	53-197
	53-197	54-29	54-29	54-29	54-32	54-41	54-51	54-51	56-17	56-17	56-17	56-18	56-18	56-21
	56-25	56-48	56-48	56-50	56-50	56-53	56-58	56-81	56-81	56-83	56-83	56-107	57-16	57-16
	57-16	57-17	57-17	57-20	57-24	57-27	57-29	57-40	57-42	57-48	57-48	57-50	57-50	57-53
	57-57	57-60	57-69	57-71	57-85	57-85	57-86	57-86	57-111	58-20	58-20	58-20	58-21	58-21
	58-24	58-27	58-30	58-40	58-45	58-45	58-47	58-47	58-52	58-61	58-61	58-63	58-63	58-66
	58-69	58-72	58-74	58-79	58-79	58-81	58-81	58-85	58-97	58-101	58-103	58-103	58-107	58-107
	59-15	59-15	59-15	59-17	59-17	59-20	59-23	59-33	59-37	59-45	59-50	59-50	59-52	59-52
	59-56	59-59	59-69	59-69	59-71	59-71	59-77	60-14	60-14	60-14	60-15	60-15	60-18	60-21
	60-24	60-33	60-39	60-57	60-61	60-61	60-63	60-63	60-66	60-69	60-72	60-81	60-85	60-105
	60-105	60-106	60-106	60-111	61-13	61-13	61-13	61-14	61-14	61-17	61-20	61-22	61-41	61-41
	61-43	61-43	61-46	61-49	61-52	61-74	61-74	61-76	61-76	61-79	61-82	61-85	61-88	61-107
	61-107	61-109	61-109	62-10	62-10	62-10	62-13	62-23	62-26	62-29	62-36	62-38	62-65	62-65
	64-9	64-9	64-9	64-12	64-15	64-18	64-27	64-44	64-44	65-15	65-15	65-15	65-16	65-16
	65-28	65-40	65-40	65-42	65-42	65-56	65-68	65-68	65-70	65-70	65-80	65-92	65-92	65-94
	65-94	65-97	65-100	65-103	65-110	65-122	65-122	65-124	65-124	65-127	65-130	65-137	65-149	65-149
	65-151	65-151	67-11	67-11	67-11	67-25	67-37	67-40	67-43	67-47	67-51	67-134	67-134	68-12
	68-12	68-12	68-91	68-104	68-107	68-110	68-128	68-134	68-137	68-258	68-258	70-46	70-46	70-46
	70-60	70-66	70-68	70-83	70-83	71-46	71-46	71-46	71-56	71-68	71-68	72-24	72-24	72-24
	72-35	72-48	72-48	73-24	73-24	73-24	73-36	73-53	73-53	74-23	74-23	74-23	74-34	74-47
	74-47	75-19	76-17	76-30										
F$HARD	14-15#	75-13	75-19											
F$HW	14-15#	17-10	17-24											

F$INIT	14-15#	45-8	45-171											
F$JMP	14-15#													
F$MOD	14-15#	14-18	76-30											
F$MSG	14-15#	42-8	42-24	42-27	42-34	42-36	42-61	42-64	42-97	42-101	42-105	42-107	42-111	42-114
	42-116	42-118	42-120	42-122	42-126	56-85	56-107	57-88	57-111	59-75	59-77	60-109	60-111	
F$PROT	14-15#	44-8	44-14											
F$PWR	14-15#													
F$RPT	14-15#													
F$SEG	14-15#													
F$SOFT	14-15#	76-13	76-17											
F$SRV	14-15#	48-9	48-262	48-267	48-362	48-367	48-371	51-50	51-60					
F$SUB	14-15#	53-33	53-56	53-59	53-160	53-162	53-195	56-18	56-48	56-50	56-81	57-17	57-48	57-50
	57-85	58-21	58-45	58-47	58-61	58-63	58-79	58-81	58-103	59-17	59-50	59-52	59-69	60-15
	60-61	60-63	60-105	61-14	61-41	61-43	61-74	61-76	61-107	65-16	65-40	65-42	65-68	65-70
	65-92	65-94	65-122	65-124	65-149									
F$SW	14-15#	18-8	18-12											
F$TEST	14-15#	51-19	51-47	53-32	53-197	54-29	54-51	56-17	56-83	57-16	57-86	58-20	58-107	59-15
	59-71	60-14	60-106	61-13	61-109	62-10	62-65	64-9	64-44	65-15	65-151	67-11	67-134	68-12
	68-258	70-46	70-83	71-46	71-68	72-24	72-48	73-24	73-53	74-23	74-47			
FINIT1	45-55	45-172#												
FINIT2	45-76	45-173#												
FINIT3	45-163	45-174#												
FLAG	20-100#	53-60*	53-134	53-137*	53-146	53-149*	53-163*	53-178	53-181*					
FMDROP	49-11	49-16#												
FMG1	42-10	42-32	42-41	42-133#	57-89									
FMG10	42-95	42-141#												
FMG11	42-108	42-142#												
FMG12	42-102	42-143#												
FMG13	42-103	42-109	42-144#											
FMG14	42-110	42-145#												
FMG15	42-104	42-146#												
FMG16	42-115	42-147#												
FMG17	42-119	42-148#												
FMG18	42-125	42-149#												
FMG19	42-59	42-150#	54-35											
FMG2	42-11	42-33	42-134#											
FMG21	42-12	42-151#												
FMG22	42-13	42-152#												
FMG23	42-22	42-153#												
FMG24	42-23	42-154#												
FMG3	42-9	42-30	42-39	42-67	42-135#									
FMG4	42-46	42-136#												
FMG5	42-51	42-54	42-137#											
FMG7	42-74	42-138#	60-110											
FMG8	42-81	42-139#												
FMG9	42-88	42-140#												
FMS1	28-75	28-98#												
FMS2	28-84	28-99#												
FMS3	32-56	32-75#												
FMT0	51-58	51-63#												
FMT1	53-40	53-198#												
FMT11	57-90	57-117#												
FMT12	57-93	57-118#												
FMT13	57-97	57-119#												
FMT14	57-101	57-120#												
FMT15	57-105	57-121#												
FMT16	57-109	57-122#												

FMT19	59-76	59-83#												
FMT2	53-46	53-199#												
FMT25	68-86	68-251	68-262#											
FMT3	53-140	53-152	53-200#											
FMT4	53-184	53-201#												
FMT5	56-88	56-113#												
FMT6	56-92	56-114#												
FMT7	56-97	56-115#												
FMT8	56-101	56-116#												
FMT9	56-105	56-117#												
FRSPAS	20-47#	45-22*	45-42*											
FRSTIM	20-46#	45-19	45-21*											
G$CNTO	14-15#													
G$DELM	14-15#	28-63	29-49	30-73	41-54									
G$DISP	14-15#													
G$EXCP	14-15#													
G$HILI	14-15#													
G$LOLI	14-15#													
G$NO	14-15#													
G$OFFS	14-15#	75-15	75-16	75-17	76-15									
G$OFSI	14-15#	75-15	75-16	75-17	76-15									
G$PRMA	14-15#	75-15	75-16											
G$PRMD	14-15#	75-17	76-15											
G$PRML	14-15#													
G$RADA	14-15#													
G$RADB	14-15#													
G$RADD	14-15#													
G$RADL	14-15#													
G$RADO	14-15#	75-15	75-16	75-17	76-15									
G$XFER	14-15#													
G$YES	14-15#	75-15	75-16	75-17	76-15									
GETPRM	45-34	45-44#	45-49											
HALTC	19-66#	37-34	48-277	65-34	65-62	65-86	65-116	65-143						
HDX	19-64#	58-50												
HELP	14-3#	14-36	15-13	16-10	22-26									
HICRC	20-131#	53-70*	53-111*	53-117	53-118*	53-119*	53-143*	53-144	53-152					
HIWORD	20-133#	53-83*	53-87*	53-112*	53-144	53-152								
HL1	19-91#	37-20	48-35	48-176	48-228	48-248								
HOE	19-8#													
I$AU	14-15#													
I$AUTO	14-15#	46-8#	46-28#											
I$CLN	14-15#	47-9#	47-16#											
I$DU	14-15#	49-8#	49-13#											
I$HRD	75-13#	75-19#												
I$INIT	14-15#	45-8#	45-171#											
I$MOD	14-15#	14-18	14-18#	76-30	76-30#									
I$MSG	14-15#	42-8#	42-24#	42-27#	42-34#	42-36#	42-61#	42-64#	42-97#	42-101#	42-105#	42-107#	42-111#	42-114#
	42-116#	42-118#	42-120#	42-122#	42-126#	56-85#	56-107#	57-88#	57-111#	59-75#	59-77#	60-109#	60-111#	
I$PROT	14-15#	44-8#												
I$PTAB	14-15#													
I$PWR	14-15#													
I$RPT	14-15#													
I$SEG	14-15#	51-19	53-32	53-33	53-59	53-162	54-29	56-17	56-18	56-50	57-16	57-17	57-50	58-20
	58-21	58-47	58-63	58-81	59-15	59-17	59-52	60-14	60-15	60-63	61-13	61-14	61-43	61-76
	62-10	64-9	65-15	65-16	65-42	65-70	65-94	65-124	67-11	68-12	70-46	71-46	72-24	73-24
	74-23													
I$SETU	14-15#													

I$SFT	76-13#	76-17#												
I$SRV	14-15#	48-9#	48-262#	48-267#	48-362#	48-367#	48-371#	51-50#	51-60#					
I$SUB	14-15#	51-19	53-32	53-33	53-33#	53-56	53-56#	53-56#	53-59	53-59#	53-160	53-160#	53-160#	53-162
	53-162#	53-195	53-195#	53-195#	54-29	56-17	56-18	56-18#	56-48	56-48#	56-48#	56-50	56-50#	56-81
	56-81#	56-81#	57-16	57-17	57-17#	57-48	57-48#	57-48#	57-50	57-50#	57-85	57-85#	57-85#	58-20
	58-21	58-21#	58-45	58-45#	58-45#	58-47	58-47#	58-61	58-61#	58-61#	58-63	58-63#	58-79	58-79#
	58-79#	58-81	58-81#	58-103	58-103#	58-103#	59-15	59-17	59-17#	59-50	59-50#	59-50#	59-52	59-52#
	59-69	59-69#	59-69#	60-14	60-15	60-15#	60-61	60-61#	60-61#	60-63	60-63#	60-105	60-105#	60-105#
	61-13	61-14	61-14#	61-41	61-41#	61-41#	61-43	61-43#	61-74	61-74#	61-74#	61-76	61-76#	61-107
	61-107#	61-107#	62-10	64-9	65-15	65-16	65-16#	65-40	65-40#	65-40#	65-42	65-42#	65-68	65-68#
	65-68#	65-70	65-70#	65-92	65-92#	65-92#	65-94	65-94#	65-122	65-122#	65-122#	65-124	65-124#	65-149
	65-149#	65-149#	67-11	68-12	70-46	71-46	72-24	73-24	74-23					
I$TST	14-15#	51-19	51-19#	51-47	51-47#	51-47#	53-32	53-32#	53-33	53-59	53-162	53-197	53-197#	53-197#
	54-29	54-29#	54-32	54-41	54-51	54-51#	54-51#	56-17	56-17#	56-18	56-21	56-25	56-50	56-53
	56-58	56-83	56-83#	56-83#	57-16	57-16#	57-17	57-20	57-24	57-27	57-29	57-40	57-42	57-50
	57-53	57-57	57-60	57-69	57-71	57-86	57-86#	57-86#	58-20	58-20#	58-21	58-24	58-27	58-30
	58-40	58-47	58-52	58-63	58-66	58-69	58-72	58-74	58-81	58-85	58-97	58-101	58-107	58-107#
	58-107#	59-15	59-15#	59-17	59-20	59-23	59-33	59-37	59-45	59-52	59-56	59-59	59-71	59-71#
	59-71#	60-14	60-14#	60-15	60-18	60-21	60-24	60-33	60-39	60-57	60-63	60-66	60-69	60-72
	60-81	60-85	60-106	60-106#	60-106#	61-13	61-13#	61-14	61-17	61-20	61-22	61-43	61-46	61-49
	61-52	61-76	61-79	61-82	61-85	61-88	61-109	61-109#	61-109#	62-10	62-10#	62-13	62-23	62-26
	62-29	62-36	62-38	62-65	62-65#	62-65#	64-9	64-9#	64-12	64-15	64-18	64-27	64-44	64-44#
	64-44#	65-15	65-15#	65-16	65-28	65-42	65-56	65-70	65-80	65-94	65-97	65-100	65-103	65-110
	65-124	65-127	65-130	65-137	65-151	65-151#	65-151#	67-11	67-11#	67-25	67-37	67-40	67-43	67-47
	67-51	67-134	67-134#	67-134#	68-12	68-12#	68-91	68-104	68-107	68-110	68-128	68-134	68-137	68-258
	68-258#	68-258#	70-46	70-46#	70-60	70-66	70-68	70-83	70-83#	70-83#	71-46	71-46#	71-56	71-68
	71-68#	71-68#	72-24	72-24#	72-35	72-48	72-48#	72-48#	73-24	73-24#	73-36	73-53	73-53#	73-53#
	74-23	74-23#	74-34	74-47	74-47#	74-47#								
IBE	19-8#													
IDU	19-8#													
IECLR	19-47#	41-102	48-162	48-168										
IEO	19-54#	41-103	48-89	48-357										
IER	19-8#													
IESET	19-44#	41-41	41-102	48-185	48-202	48-207	48-213	48-228	48-233	48-248	48-253			
INFACE	20-44#	31-65	45-142*	45-145*	48-197									
INFLAG	20-106#	41-30*	41-49	48-180	48-256*	48-286								
INISR	45-93	48-9#												
INRCV	20-91#	41-26*	42-14*	42-18*	42-22	48-110*	48-216	48-220						
INTER	19-106#	31-73	48-33	48-193	48-202									
INXMIT	20-92#	41-27*	42-15*	42-19*	42-22	48-118*	48-236	48-240						
ISP13	19-130#	57-30	57-43	57-90										
ISP7	19-129#	56-27	56-60	58-41	58-75									
ISR	19-8#													
IXE	19-8#													
J$JMP	14-15#													
L$ACP	15-11#													
L$APT	15-11#													
L$AUT	15-11#													
L$AUTO	15-11	46-8#												
L$CCP	15-11#													
L$CLEA	15-11	47-9#												
L$CO	15-11#													
L$DEPO	15-11#													
L$DESC	15-11	22-18#												
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L$DEVP	15-11#													
L$DISP	15-11	16-8#												

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L$DTP   15-11#
L$DTYP  15-11#
L$DU    15-11    49-8#
L$DUT   15-11#
L$DVTY  15-11    22-13#
L$EF    15-11#
L$ENVI  15-11#
L$ETP   15-11#
L$EXP1  15-11#
L$EXP4  15-11#
L$EXP5  15-11#
L$HARD  15-11    75-13    75-13#
L$HIME  15-11#   40-44    68-29    68-215
L$HPCP  15-11#
L$HPTP  15-11#
L$HW    15-11    17-10    17-10#
L$ICP   15-11#
L$INIT  15-11    45-8#
L$LADP  15-11#
L$LAST  15-11    76-32#
L$LOAD  15-11#
L$LUN   15-11#
L$MREV  15-11#
L$NAME  15-11#
L$PRIO  15-11#
L$PROT  15-11    44-8#
L$PRT   15-11#
L$REPP  15-11#
L$REV   15-11#
L$SOFT  15-11    76-13    76-13#
L$SPC   15-11#
L$SPCP  15-11#
L$SPTP  15-11#
L$STA   15-11#
L$SW    15-11    18-8     18-8#
L$TEST  15-11#   35-43    41-104
L$TIML  15-11#
L$UNIT  15-11#   45-46
L10000  17-10    17-24#
L10001  18-8     18-12#
L10002  42-24#
L10003  42-34#
L10004  42-61#
L10005  42-97#
L10006  42-105#
L10007  42-111#
L10010  42-116#
L10011  42-120#
L10012  42-126#
L10014  45-171#
L10015  46-28#
L10016  47-16#
L10017  48-262#
L10020  48-362#
L10021  48-371#
L10022  49-13#
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L10025	53-197#												
L10026	53-56#												
L10027	53-160#												
L10030	53-195#												
L10031	54-32	54-41	54-51#										
L10032	56-21	56-25	56-53	56-58	56-83#								
L10033	56-48#												
L10034	56-81#												
L10035	56-107#												
L10036	57-20	57-24	57-27	57-29	57-40	57-42	57-53	57-57	57-60	57-69	57-71	57-86#	
L10037	57-48#												
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L10042	58-24	58-27	58-30	58-40	58-52	58-66	58-69	58-72	58-74	58-85	58-97	58-101	58-107#
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L10045	58-79#												
L10046	58-103#												
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L10050	59-50#												
L10051	59-69#												
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L10056	60-111#												
L10057	61-17	61-20	61-22	61-46	61-49	61-52	61-79	61-82	61-85	61-88	61-109#		
L10060	61-41#												
L10061	61-74#												
L10062	61-107#												
L10063	62-13	62-23	62-26	62-29	62-36	62-38	62-65#						
L10064	64-12	64-15	64-18	64-27	64-44#								
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L10067	65-68#												
L10070	65-92#												
L10071	65-122#												
L10072	65-149#												
L10073	67-25	67-37	67-40	67-43	67-47	67-51	67-134#						
L10074	68-91	68-104	68-107	68-110	68-128	68-134	68-137	68-258#					
L10075	70-60	70-66	70-68	70-83#									
L10076	71-56	71-68#											
L10077	72-35	72-48#											
L10100	73-36	73-53#											
L10101	74-34	74-47#											
L10102	75-13	75-19#											
L10103	76-13	76-17#											
LAST	20-117#	48-154*	48-176	48-191	48-193								
LF	19-144#	75-23	75-24	75-25	75-27	75-27	75-29	75-30	75-32	75-34	75-34	75-35	76-19
LLOOP	19-141#	39-29	48-54										
LOCATE	51-21	51-50#											
LOCRC	20-130#	53-68*	53-100*	53-106	53-107*	53-108*	53-130*	53-131	53-140				
LOE	19-8#												
LOGDEV	20-120#	45-41*	45-45*	45-46	45-48	46-24	49-11	51-41	53-40				
LOT	19-8#												

LOWORD	20-132#	53-82*	53-86*	53-101*	53-131	53-140								
LPLU	19-38#	48-99	48-102	57-22	57-36	57-55	58-25	58-48	58-67	58-88	58-91	59-21	60-19	60-67
	61-18	61-47	61-80	62-14	64-13	65-20	65-25	65-98	65-128	67-28	67-31	68-95	68-98	70-64
MAINT	19-67#	32-46	48-69	58-70	60-22									
MAINT1	19-77#	39-32	39-37	48-57	48-60									
MAINT2	19-80#	39-31	39-38	48-56	48-61									
MANUF	20-70#	45-149												
MCLR	19-35#	30-51	30-54	47-13										
MDIAG	19-36#	30-54												
MICRO	20-34#													
MMANAG	20-56#	40-47*	40-112*	41-68	41-77	41-92	41-98	48-122	48-297					
MNTMDE	20-55#	48-67	70-54*	71-50*	72-29*	73-30*	74-28*							
MNTREC	19-78#													
MODEM	59-26	59-73#												
N	19-120#	56-37	56-70	56-90										
NAKS	19-82#													
NESTPC	20-123#	28-40	28-86	29-32	29-55	31-41*	31-80*	32-38*	32-71*	33-36	33-45	33-46*	33-49*	33-71
	34-34*	34-47*	35-26	35-56	37-22*	37-39*	39-40*	39-47*	41-25*	41-118*				
NEWST	45-32	45-40#	45-47											
NEXT	48-16	48-175#												
NOBFR	19-79#	60-50	60-91											
NOXMEM	40-38	46-10	48-367#	68-15	68-58	68-235								
NXM	19-71#	61-35	61-67	61-101										
NXMFLG	20-104#	40-37*	40-40	40-79	40-88	40-204*	45-18*	46-11*	46-22	46-26*	47-11	48-369*	51-22*	51-39
	51-43*	51-52	51-56*	68-16*	68-19	68-23*	68-57*	68-66	68-76	68-83	68-234*	68-239	68-246	
O$APTS	14-15#	15-11												
O$AU	14-15#	15-11												
O$BGNR	14-15#	15-11												
O$BGNS	14-15#	14-34#	15-11											
O$DU	14-15#	14-34#	15-11											
O$ERRT	14-15#	15-11												
O$GNSW	14-15#	14-34#	15-11											
O$POIN	14-15#	14-34	14-34#	14-34#	14-34#	15-11								
O$SETU	14-15#	15-11	76-32											
OUTFLG	20-109#	41-31*	41-51	48-182	48-288	48-358*								
OUTISR	45-94	48-267#												
OUTRCV	20-93#	41-28*	42-16*	42-20*	42-23	48-342*	48-354							
OUTXMT	20-94#	41-29*	42-17*	42-21*	42-23	48-330*	48-352							
P1	75-15	75-21#												
P2	75-16	75-22#												
P3	75-17	75-23#												
PATCH	76-24#													
PNT	19-8#													
PRETIM	19-124#	57-72	57-91	57-93										
PRI	19-8#													
PRI00	19-8#													
PRI01	19-8#													
PRI02	19-8#													
PRI03	19-8#													
PRI04	19-8#	41-38												
PRI05	19-8#	45-93	45-94											
PRI06	19-8#													
PRI07	19-8#	40-38	40-48	41-117	45-10	46-10	51-21	68-15	68-33	68-58	68-235			
PSTACK	20-121#	45-11*												
R	19-119#	56-35	56-68	56-86	56-88									
RBUF	20-178#	61-86	64-19	65-77	65-101	65-134	67-15	67-45	67-91	67-103				
RCOUNT	20-177#	61-57	61-86	64-19	65-77	65-101	67-12	67-45	67-96	67-101				

RCV	19-50#	48-328	67-61	67-121	68-144	68-202								
RCVBUF	20-192#	40-95*	40-128*	40-129*	40-164	40-172	40-173	41-34	41-36	41-65				
RDI	19-43#	28-57	29-44	48-14										
RDO	19-53#	28-55	31-70	32-69	37-38	48-269	48-360	60-42	60-55	60-58	61-39	61-72	61-105	65-38
	65-66	65-90	65-120	65-147	67-121	68-202								
RES	19-59#	31-58	48-92	57-36	58-48	61-27								
RESFLG	20-111#	48-93*	48-222	48-231*	48-242	48-251*								
RESUME	20-53#	45-14*	48-178	48-218	48-238	48-291	70-52*	71-48*	72-27*	73-28*	74-26*			
RETURN	19-135#													
REV1	53-43*	53-46	53-208#											
REV2	53-44*	53-46	53-209#											
RFLAG	20-176#	67-22*	67-85	67-90*	67-122	68-113*	68-162	68-167*	68-203	68-218*				
RLOOP	19-142#													
RMODEM	19-107#	58-32	58-53	59-35	59-57									
ROMADR	20-134#	38-19	38-28	53-39*	53-52*	53-65*	53-84*	53-90*	53-165*	53-192*				
ROMI	19-40#	38-20	38-26	38-29	38-35									
ROMLOC	53-184	53-206#												
ROMO	19-39#	38-36												
RQI	19-46#	29-31	31-40	31-73	32-37	33-44	37-20	41-41	48-163	48-185	48-202	48-207	48-213	48-228
	48-233	48-248	48-253	58-32	58-53	59-35	59-57	60-36	60-82	61-57	61-59	61-86	61-93	62-34
	64-19	64-24	65-77	65-101	65-107	65-134	67-45	67-49	68-125	68-131				
RRAM	19-105#													
RSEL4	68-117*	68-126#	68-168	68-225*										
RSEL6	68-118*	68-127#	68-173	68-226*										
RUN	19-34#	30-68	42-42											
S$LSYM	14-15#	17-24#	18-12#	42-24#	42-34#	42-61#	42-97#	42-105#	42-111#	42-116#	42-120#	42-126#	45-171#	46-28#
	47-16#	48-262#	48-362#	48-371#	49-13#	51-47#	51-60#	53-56#	53-160#	53-195#	53-197#	54-51#	56-48#	56-81#
	56-83#	56-107#	57-48#	57-85#	57-86#	57-111#	58-45#	58-61#	58-79#	58-103#	58-107#	59-50#	59-69#	59-71#
	59-77#	60-61#	60-105#	60-106#	60-111#	61-41#	61-74#	61-107#	61-109#	62-65#	64-44#	65-40#	65-68#	65-92#
	65-122#	65-149#	65-151#	67-134#	68-258#	70-83#	71-68#	72-48#	73-53#	74-47#	75-19#	76-17#		
S1	76-15	76-19#												
SAVE	20-99#	33-41*	33-54	33-75*										
SECN	19-62#													
SEL0	20-19#	28-57	29-31*	29-44	30-51*	30-54*	30-68	31-47*	31-70	33-44*	37-20*	38-18*	38-20*	38-25*
	38-26*	38-29*	38-33*	38-35*	38-36*	41-102*	42-10	42-32	42-41	42-42	47-13*	48-12	48-14	48-99*
	48-102*	48-162*	48-163*	48-168*	48-185*	51-32	57-89	58-32*	58-53*	59-35*	59-57*			
SEL2	20-16#	20-22	28-55	28-76	32-59	32-69*	37-21*	37-29	37-38*	38-19*	41-103*	42-10	42-32	42-41
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	60-86	61-30	61-39*	61-62	61-72*	61-96	61-105*	62-53	64-28	65-29	65-38*	65-57	65-66*	65-81
	65-90*	65-111	65-120*	65-138	65-147*	67-56	67-61	67-121*	68-139	68-144	68-202*			
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	58-34	58-55	67-72	67-91	68-152	68-168								
SEL6	20-18#	20-26	31-51*	31-58	32-44*	32-46	32-64	33-59*	33-64*	33-66*	34-42*	37-34	38-21*	38-30*
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	48-92*	48-112*	48-120*	48-125*	48-277	48-279	48-299	48-306*	48-337	48-349	51-38	60-50	60-91	61-35
	61-67	61-101	62-58	64-33	65-34	65-62	65-86	65-116	65-143	67-77	67-96	68-157	68-173	
SFLAG	20-101#	68-114*	68-177	68-211	68-214*									
SFPTBL	18-8#													
SKIP	20-102#													
SPEED	18-10#	45-100												
STARES	20-48#	45-38*	45-43*	45-161	53-34									
STARST	45-28	45-30	45-37#											
START	20-52#	41-32*	48-87	48-199	48-210	48-212*								
STLU	19-37#													
STREC	19-72#													
STUP	19-41#	38-25	38-26	38-33	38-35									

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CZDMICO DMR-11 FUNCTIONAL TESTS MACRO V03.01 30-JUL-80 11:38:40 PAGE S-13                                SEQ  198
CROSS REFERENCE TABLE (CREF V01-05 )

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	68-198	68-198	68-198	68-235	68-235	68-235	68-235	68-235	68-235	68-235	68-235	68-235	68-235	68-235
	68-235	68-235	68-235	68-235	68-235	68-235	68-235	68-245	68-245	68-245	68-245	68-245	68-245	68-250
	68-250	68-250	68-250	68-250	68-250	68-250	68-250	68-250	68-250	68-250	68-250	68-251	68-251	68-251
	68-251	68-251	68-251	68-251	68-251	68-251	68-251	68-251	68-251	68-251	68-251	68-251	68-251	68-251
	68-251	68-258	68-258	68-258	70-60	70-60	70-60	70-60	70-60	70-60	70-66	70-66	70-66	70-66
	70-66	70-66	70-68	70-68	70-68	70-68	70-68	70-68	70-83	70-83	70-83	71-56	71-56	71-56
	71-56	71-56	71-56	71-68	71-68	71-68	72-35	72-35	72-35	72-35	72-35	72-35	72-48	72-48
	72-48	73-36	73-36	73-36	73-36	73-36	73-36	73-53	73-53	73-53	74-34	74-34	74-34	74-34
	74-34	74-34	74-47	74-47	74-47	75-13	75-13	75-13	75-15	75-15	75-15	75-15	75-15	75-15
	75-15	75-15	75-15	75-15	75-15	75-15	75-16	75-16	75-16	75-16	75-16	75-16	75-16	75-16
	75-16	75-16	75-16	75-16	75-17	75-17	75-17	75-17	75-17	75-17	75-17	75-17	75-17	75-17
	75-17	75-17	75-17	75-17	75-17	75-19	75-19	75-19	76-13	76-13	76-13	76-15	76-15	76-15
	76-15	76-15	76-15	76-15	76-15	76-15	76-15	76-15	76-15	76-15	76-15	76-15	76-17	76-17
	76-17	76-32	76-32	76-32	76-32	76-32	76-32	76-32	76-32	76-32				
SVCSUB	14-15#	14-25#	53-33	53-59	53-162	56-18	56-50	57-17	57-50	58-21	58-47	58-63	58-81	59-17
	59-52	60-15	60-63	61-14	61-43	61-76	65-16	65-42	65-70	65-94	65-124			
SVCTAG	14-15#	14-27#	17-24	18-12	42-24	42-34	42-61	42-97	42-105	42-111	42-116	42-120	42-126	45-171
	46-28	47-16	48-262	48-362	48-371	49-13	51-47	51-60	53-56	53-160	53-195	53-197	54-51	56-48
	56-81	56-83	56-107	57-48	57-85	57-86	57-111	58-45	58-61	58-79	58-103	58-107	59-50	59-69

	59-71	59-77	60-61	60-105	60-106	60-111	61-41	61-74	61-107	61-109	62-65	64-44	65-40	65-68
	65-92	65-122	65-149	65-151	67-134	68-258	70-83	71-68	72-48	73-53	74-47	75-19	76-17	
SVCTST	14-15#	14-24#	51-19	53-32	54-29	56-17	57-16	58-20	59-15	60-14	61-13	62-10	64-9	65-15
	67-11	68-12	70-46	71-46	72-24	73-24	74-23							
SW00	19-29#													
SW01	19-28#													
SW02	19-27#													
SW03	19-26#													
SW04	19-25#													
SW05	19-24#													
SW06	19-23#													
SW07	19-22#													
SW08	19-21#													
SW09	19-20#													
SW10	19-19#													
SW11	19-18#													
SW12	19-17#													
SW13	19-16#													
SW14	19-15#													
SW15	19-14#													
T	19-122#	56-41	56-74	56-99	56-101									
T$$AUT	46-8#	46-28												
T$$CLE	47-9#	47-16												
T$$DU	49-8#	49-13												
T$$HAR	75-13	75-13#	75-19											
T$$HW	17-10	17-10#	17-24											
T$$INI	45-8#	45-171												
T$$MSG	42-8#	42-24	42-27#	42-34	42-36#	42-61	42-64#	42-97	42-101#	42-105	42-107#	42-111	42-114#	42-116
	42-118#	42-120	42-122#	42-126	56-85#	56-107	57-88#	57-111	59-75#	59-77	60-109#	60-111		
T$$PRO	44-8#													
T$$SOF	76-13	76-13#	76-17											
T$$SRV	48-9#	48-262	48-267#	48-362	48-367#	48-371	51-50#	51-60						
T$$SUB	53-33#	53-56	53-59#	53-160	53-162#	53-195	56-18#	56-48	56-50#	56-81	57-17#	57-48	57-50#	57-85
	58-21#	58-45	58-47#	58-61	58-63#	58-79	58-81#	58-103	59-17#	59-50	59-52#	59-69	60-15#	60-61
	60-63#	60-105	61-14#	61-41	61-43#	61-74	61-76#	61-107	65-16#	65-40	65-42#	65-68	65-70#	65-92
	65-94#	65-122	65-124#	65-149										
T$$SW	18-8	18-8#	18-12											
T$$TES	51-19#	51-47	53-32#	53-197	54-29#	54-32	54-41	54-51	56-17#	56-21	56-25	56-53	56-58	56-83
	57-16#	57-20	57-24	57-27	57-29	57-40	57-42	57-53	57-57	57-60	57-69	57-71	57-86	58-20#
	58-24	58-27	58-30	58-40	58-52	58-66	58-69	58-72	58-74	58-85	58-97	58-101	58-107	59-15#
	59-20	59-23	59-33	59-37	59-45	59-56	59-59	59-71	60-14#	60-18	60-21	60-24	60-33	60-39
	60-57	60-56	60-69	60-72	60-81	60-85	60-106	61-13#	61-17	61-20	61-22	61-46	61-49	61-52
	61-79	61-82	61-85	61-88	61-109	62-10#	62-13	62-23	62-26	62-29	62-36	62-38	62-65	64-9#
	64-12	64-15	64-18	64-27	64-44	65-15#	65-28	65-56	65-80	65-97	65-100	65-103	65-110	65-127
	65-130	65-137	65-151	67-11#	67-25	67-37	67-40	67-43	67-47	67-51	67-134	68-12#	68-91	68-104
	68-107	68-110	68-128	68-134	68-137	68-258	70-46#	70-60	70-66	70-68	70-83	71-46#	71-56	71-68
	72-24#	72-35	72-48	73-24#	73-36	73-53	74-23#	74-34	74-47					
T$ARGC	15-11	15-11	15-11	15-11	15-11	15-11	15-11	15-11	15-11	15-11	15-11	15-11#	15-11#	15-11#
	15-11#	15-11#	15-11#	28-75	28-75	28-75#	28-84	28-84	28-84#	32-56	32-56	32-56#	42-9	42-9
	42-9	42-9#	42-9#	42-10	42-10	42-10	42-10	42-10#	42-10#	42-10#	42-11	42-11	42-11	42-11
	42-11#	42-11#	42-11#	42-12	42-12	42-12	42-12#	42-12#	42-13	42-13	42-13	42-13#	42-13#	42-22
	42-22	42-22	42-22	42-22#	42-22#	42-22#	42-23	42-23	42-23	42-23	42-23#	42-23#	42-23#	42-30
	42-30	42-30	42-30#	42-30#	42-32	42-32	42-32	42-32	42-32#	42-32#	42-32#	42-33	42-33	42-33
	42-33	42-33#	42-33#	42-33#	42-39	42-39	42-39	42-39#	42-39#	42-41	42-41	42-41	42-41	42-41#
	42-41#	42-41#	42-46	42-46	42-46#	42-51	42-51	42-51#	42-54	42-54	42-54#	42-59	42-59	42-59#
	42-67	42-67	42-67	42-67#	42-67#	42-74	42-74	42-74	42-74	42-74#	42-74#	42-74#	42-81	42-81
	42-81	42-81	42-81#	42-81#	42-81#	42-88	42-88	42-88	42-88	42-88#	42-88#	42-88#	42-95	42-95

	42-95	42-95	42-95#	42-95#	42-95#	42-102	42-102	42-102#	42-103	42-103	42-103	42-103	42-103#	42-103#
	42-103#	42-104	42-104	42-104	42-104#	42-104#	42-108	42-108	42-108#	42-109	42-109	42-109	42-109	42-109#
	42-109#	42-109#	42-110	42-110	42-110	42-110	42-110#	42-110#	42-110#	42-115	42-115	42-115	42-115	42-115#
	42-115#	42-115#	42-119	42-119	42-119	42-119	42-119#	42-119#	42-119#	42-125	42-125	42-125	42-125	42-125#
	42-125#	42-125#	45-55	45-55	45-55	45-55	45-55#	45-55#	45-55#	45-76	45-76	45-76	45-76	45-76#
	45-76#	45-76#	45-163	45-163	45-163#	49-11	49-11	49-11	49-11#	49-11#	51-58	51-58	51-58	51-58
	51-58#	51-58#	51-58#	53-40	53-40	53-40	53-40#	53-40#	53-46	53-46	53-46	53-46	53-46	53-46
	53-46#	53-46#	53-46#	53-46#	53-46#	53-140	53-140	53-140	53-140	53-140	53-140#	53-140#	53-140#	53-140#
	53-152	53-152	53-152	53-152	53-152	53-152#	53-152#	53-152#	53-152#	53-184	53-184	53-184	53-184	53-184
	53-184#	53-184#	53-184#	53-184#	54-35	54-35	54-35#	56-88	56-88	56-88	56-88#	56-88#	56-92	56-92
	56-92	56-92#	56-92#	56-97	56-97	56-97	56-97#	56-97#	56-101	56-101	56-101	56-101#	56-101#	56-105
	56-105	56-105	56-105#	56-105#	57-89	57-89	57-89	57-89	57-89#	57-89#	57-89#	57-90	57-90	57-90
	57-90#	57-90#	57-93	57-93	57-93	57-93#	57-93#	57-97	57-97	57-97	57-97#	57-97#	57-101	57-101
	57-101	57-101#	57-101#	57-105	57-105	57-105	57-105#	57-105#	57-109	57-109	57-109	57-109#	57-109#	59-76
	59-76	59-76	59-76	59-76#	59-76#	59-76#	60-110	60-110	60-110	60-110	60-110#	60-110#	60-110#	68-86
	68-86	68-86	68-86#	68-86#	68-251	68-251	68-251	68-251#	68-251#					
T$CODE	75-15	75-15	75-15	75-15#	75-15#	75-15#	75-16	75-16	75-16	75-16#	75-16#	75-16#	75-17	75-17
	75-17	75-17#	75-17#	75-17#	76-15	76-15	76-15	76-15#	76-15#	76-15#				
T$ERRN	14-15#	28-67	28-67#	28-78	28-78#	29-52	29-52#	30-76	30-76#	32-61	32-61#	32-66	32-66#	35-54
	35-54#	37-31	37-31#	37-36	37-36#	41-59	41-59#	41-81	41-81#	41-96	41-96#	48-37	48-37#	48-272
	48-272#	48-283	48-283#	48-294	48-294#	48-303	48-303#	48-334	48-334#	48-339	48-339#	48-345	48-345#	51-55
	51-55#	53-138	53-138#	53-150	53-150#	53-182	53-182#	54-49	54-49#	56-31	56-31#	56-46	56-46#	56-64
	56-64#	56-79	56-79#	57-33	57-33#	57-46	57-46#	57-83	57-83#	58-36	58-36#	58-43	58-43#	58-57
	58-57#	58-77	58-77#	59-42	59-42#	59-64	59-64#	60-47	60-47#	60-52	60-52#	60-88	60-88#	60-93
	60-93#	60-102	60-102#	61-32	61-32#	61-37	61-37#	61-64	61-64#	61-69	61-69#	61-98	61-98#	61-103
	61-103#	62-44	62-44#	62-55	62-55#	62-60	62-60#	64-30	64-30#	64-36	64-36#	65-31	65-31#	65-36
	65-36#	65-59	65-59#	65-64	65-64#	65-83	65-83#	65-88	65-88#	65-113	65-113#	65-118	65-118#	65-140
	65-140#	65-145	65-145#	67-58	67-58#	67-68	67-68#	67-74	67-74#	67-79	67-79#	67-87	67-87#	67-93
	67-93#	67-98	67-98#	67-112	67-112#	67-115	67-115#	68-85	68-85#	68-141	68-141#	68-148	68-148#	68-154
	68-154#	68-159	68-159#	68-164	68-164#	68-170	68-170#	68-175	68-175#	68-198	68-198#	68-250	68-250#	
T$EXCP	75-15	75-15#	75-16	75-16#	75-17	75-17#	76-15	76-15#						
T$FLAG	54-32	54-32#	54-32#	54-41	54-41#	54-41#	56-21	56-21#	56-21#	56-25	56-25#	56-25#	56-53	56-53#
	56-53#	56-58	56-58#	56-58#	57-20	57-20#	57-20#	57-24	57-24#	57-24#	57-27	57-27#	57-27#	57-29
	57-29#	57-29#	57-40	57-40#	57-40#	57-42	57-42#	57-42#	57-53	57-53#	57-53#	57-57	57-57#	57-57#
	57-60	57-60#	57-60#	57-69	57-69#	57-69#	57-71	57-71#	57-71#	58-24	58-24#	58-24#	58-27	58-27#
	58-27#	58-30	58-30#	58-30#	58-40	58-40#	58-40#	58-52	58-52#	58-52#	58-66	58-66#	58-66#	58-69
	58-69#	58-69#	58-72	58-72#	58-72#	58-74	58-74#	58-74#	58-85	58-85#	58-85#	58-97	58-97#	58-97#
	58-101	58-101#	58-101#	59-20	59-20#	59-20#	59-23	59-23#	59-23#	59-33	59-33#	59-33#	59-37	59-37#
	59-37#	59-45	59-45#	59-45#	59-56	59-56#	59-56#	59-59	59-59#	59-59#	60-18	60-18#	60-18#	60-21
	60-21#	60-21#	60-24	60-24#	60-24#	60-33	60-33#	60-33#	60-39	60-39#	60-39#	60-57	60-57#	60-57#
	60-66	60-66#	60-66#	60-69	60-69#	60-69#	60-72	60-72#	60-72#	60-81	60-81#	60-81#	60-85	60-85#
	60-85#	61-17	61-17#	61-17#	61-20	61-20#	61-20#	61-22	61-22#	61-22#	61-46	61-46#	61-46#	61-49
	61-49#	61-49#	61-52	61-52#	61-52#	61-79	61-79#	61-79#	61-82	61-82#	61-82#	61-85	61-85#	61-85#
	61-88	61-88#	61-88#	62-13	62-13#	62-13#	62-23	62-23#	62-23#	62-26	62-26#	62-26#	62-29	62-29#
	62-29#	62-36	62-36#	62-36#	62-38	62-38#	62-38#	64-12	64-12#	64-12#	64-15	64-15#	64-15#	64-18
	64-18#	64-18#	64-27	64-27#	64-27#	65-28	65-28#	65-28#	65-56	65-56#	65-56#	65-80	65-80#	65-80#
	65-97	65-97#	65-97#	65-100	65-100#	65-100#	65-103	65-103#	65-103#	65-110	65-110#	65-110#	65-127	65-127#
	65-127#	65-130	65-130#	65-130#	65-137	65-137#	65-137#	67-25	67-25#	67-25#	67-37	67-37#	67-37#	67-40
	67-40#	67-40#	67-43	67-43#	67-43#	67-47	67-47#	67-47#	67-51	67-51#	67-51#	68-91	68-91#	68-91#
	68-104	68-104#	68-104#	68-107	68-107#	68-107#	68-110	68-110#	68-110#	68-128	68-128#	68-128#	68-134	68-134#
	68-134#	68-137	68-137#	68-137#	70-60	70-60#	70-60#	70-66	70-66#	70-66#	70-68	70-68#	70-68#	71-56
	71-56#	71-56#	72-35	72-35#	72-35#	73-36	73-36#	73-36#	74-34	74-34#	74-34#			
T$GMAN	14-15#													
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T$LAST	14-15#	76-32#												
T$LOLI	75-15	75-15#	75-16	75-16#	75-17	75-17#	76-15	76-15#						
T$LSYM	14-15	14-15#	17-24	18-12	42-24	42-34	42-61	42-97	42-105	42-111	42-116	42-120	42-126	45-171

	46-28	47-16	48-262	48-362	48-371	49-13	51-47	51-60	53-56	53-160	53-195	53-197	54-51	56-48
	56-81	56-83	56-107	57-48	57-85	57-86	57-111	58-45	58-61	58-79	58-103	58-107	59-50	59-69
	59-71	59-77	60-61	60-105	60-106	60-111	61-41	61-74	61-107	61-109	62-65	64-44	65-40	65-68
	65-92	65-122	65-149	65-151	67-134	68-258	70-83	71-68	72-48	73-53	74-47	75-19	76-17	
T$LTNO	76-32#													
T$NEST	14-15#	14-18	14-18	14-18#	17-10	17-10	17-10#	17-24	17-24	17-24	17-24#	18-8	18-8	18-8#
	18-12	18-12	18-12	18-12#	42-8	42-8	42-8#	42-24	42-24	42-24	42-24#	42-27	42-27	42-27#
	42-34	42-34	42-34	42-34#	42-36	42-36	42-36#	42-61	42-61	42-61	42-61#	42-64	42-64	42-64#
	42-97	42-97	42-97	42-97#	42-101	42-101	42-101#	42-105	42-105	42-105	42-105#	42-107	42-107	42-107#
	42-111	42-111	42-111	42-111#	42-114	42-114	42-114#	42-116	42-116	42-116	42-116#	42-118	42-118	42-118#
	42-120	42-120	42-120	42-120#	42-122	42-122	42-122#	42-126	42-126	42-126	42-126#	44-8	44-8	44-8#
	44-14	44-14	44-14	44-14#	45-8	45-8	45-8#	45-171	45-171	45-171	45-171#	46-8	46-8	46-8#
	46-28	46-28	46-28	46-28#	47-9	47-9	47-9#	47-16	47-16	47-16	47-16#	48-9	48-9	48-9#
	48-262	48-262	48-262	48-262#	48-267	48-267	48-267#	48-362	48-362	48-362	48-362#	48-367	48-367	48-367#
	48-371	48-371	48-371	48-371#	49-8	49-8	49-8#	49-13	49-13	49-13	49-13#	51-19	51-19	51-19#
	51-47	51-47	51-47	51-47#	51-50	51-50	51-50#	51-60	51-60	51-60	51-60#	53-32	53-32	53-32#
	53-33	53-33	53-33#	53-56	53-56	53-56	53-56#	53-59	53-59	53-59#	53-160	53-160	53-160	53-160#
	53-162	53-162	53-162#	53-195	53-195	53-195	53-195#	53-197	53-197	53-197	53-197#	54-29	54-29	54-29#
	54-51	54-51	54-51	54-51#	56-17	56-17	56-17#	56-18	56-18	56-18#	56-48	56-48	56-48	56-48#
	56-50	56-50	56-50#	56-81	56-81	56-81	56-81#	56-83	56-83	56-83	56-83#	56-85	56-85	56-85#
	56-107	56-107	56-107	56-107#	57-16	57-16	57-16#	57-17	57-17	57-17#	57-48	57-48	57-48	57-48#
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	65-124	65-124	65-124#	65-149	65-149	65-149	65-149#	65-151	65-151	65-151	65-151#	67-11	67-11	67-11#
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	72-48	72-48	72-48	72-48#	73-24	73-24	73-24#	73-53	73-53	73-53	73-53#	74-23	74-23	74-23#
	74-47	74-47	74-47	74-47#	75-13	75-13	75-13#	75-19	75-19	75-19	75-19#	76-13	76-13	76-13#
	76-17	76-17	76-17	76-17#	76-30	76-30	76-30	76-30#						
T$NS0	14-18#	76-30												
T$NS1	17-10#	17-24	18-8#	18-12	42-8#	42-24	42-27#	42-34	42-36#	42-61	42-64#	42-97	42-101#	42-105
	42-107#	42-111	42-114#	42-116	42-118#	42-120	42-122#	42-126	44-8#	44-14	45-8#	45-171	46-8#	46-28
	47-9#	47-16	48-9#	48-262	48-267#	48-362	48-367#	48-371	49-8#	49-13	51-19#	51-47	51-50#	51-60
	53-32#	53-197	54-29#	54-51	56-17#	56-83	56-85#	56-107	57-16#	57-86	57-88#	57-111	58-20#	58-107
	59-15#	59-71	59-75#	59-77	60-14#	60-106	60-109#	60-111	61-13#	61-109	62-10#	62-65	64-9#	64-44
	65-15#	65-151	67-11#	67-134	68-12#	68-258	70-46#	70-83	71-46#	71-68	72-24#	72-48	73-24#	73-53
	74-23#	74-47	75-13#	75-19	76-13#	76-17								
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	65-94#	65-122	65-124#	65-149										
T$PTNU	14-15#													
T$SAVL	14-15#													
T$SEGL	14-15#													
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	58-21	58-21	58-21#	58-47	58-47	58-47#	58-63	58-63	58-63#	58-81	58-81	58-81#	59-15#	59-17
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	65-42	65-42	65-42#	65-70	65-70	65-70#	65-94	65-94	65-94#	65-124	65-124	65-124#	67-11#	68-12#
	70-46#	71-46#	72-24#	73-24#	74-23#									
TSTAGL	14-15#													
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	42-36	42-36#	42-64	42-64	42-64#	42-101	42-101	42-101#	42-107	42-107	42-107#	42-114	42-114	42-114#
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SW00	19-29#													
SW01	19-28#													
SW02	19-27#													
SW03	19-26#													
SW04	19-25#													
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SW07	19-22#													
SW08	19-21#													
SW09	19-20#													
SW10	19-19#													
SW11	19-18#													
SW12	19-17#													
SW13	19-16#													
SW14	19-15#													
SW15	19-14#													
T	19-122#	56-41	56-74	56-99	56-101									
T$$AUT	46-8#	46-28												
T$$CLE	47-9#	47-16												
T$$DU	49-8#	49-13												
T$$HAR	75-13	75-13#	75-19											
T$$HW	17-10	17-10#	17-24											
T$$INI	45-8#	45-171												
T$$MSG	42-8#	42-24	42-27#	42-34	42-36#	42-65	42-68#	42-101	42-105#	42-109	42-111#	42-115	42-118#	42-120
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T$$PRO	44-8#													
T$$SOF	76-13	76-13#	76-17											
T$$SRV	48-9#	48-262	48-267#	48-362	48-367#	48-371	51-50#	51-60						
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	65-94#	65-122	65-124#	65-149										
T$$SW	18-8	18-8#	18-12											
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	68-107	68-110	68-128	68-134	68-137	68-258	70-46#	70-60	70-66	70-68	70-83	71-46#	71-56	71-68
	72-24#	72-35	72-48	73-24#	73-36	73-53	74-23#	74-34	74-47					
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	15-11#	15-11#	15-11#	28-73	28-73	28-73#	28-82	28-82	28-82#	32-56	32-56	32-56#	42-9	42-9
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	42-92#	42-99	42-99	42-99	42-99	42-99#	42-99#	42-99#	42-106	42-106	42-106#	42-107	42-107	42-107
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	75-17	75-17#	75-17#	75-17#	76-15	76-15	76-15	76-15#	76-15#	76-15#				
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	60-93#	60-102	60-102#	61-32	61-32#	61-37	61-37#	61-64	61-64#	61-69	61-69#	61-98	61-98#	61-103
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	65-145#	67-58	67-58#	67-68	67-68#	67-74	67-74#	67-79	67-79#	67-87	67-87#	67-93	67-93#	67-98
	67-98#	67-112	67-112#	67-115	67-115#	68-85	68-85#	68-141	68-141#	68-148	68-148#	68-154	68-154#	68-159
	68-159#	68-164	68-164#	68-170	68-170#	68-175	68-175#	68-198	68-198#	68-250	68-250#			
T$EXCP	75-15	75-15#	75-16	75-16#	75-17	75-17#	76-15	76-15#						
T$FLAG	54-32	54-32#	54-32#	54-41	54-41#	54-41#	56-21	56-21#	56-21#	56-25	56-25#	56-25#	56-53	56-53#
	56-53#	56-58	56-58#	56-58#	57-20	57-20#	57-20#	57-24	57-24#	57-24#	57-27	57-27#	57-27#	57-29
	57-29#	57-29#	57-40	57-40#	57-40#	57-42	57-42#	57-42#	57-53	57-53#	57-53#	57-57	57-57#	57-57#
	57-60	57-60#	57-60#	57-69	57-69#	57-69#	57-71	57-71#	57-71#	58-24	58-24#	58-24#	58-27	58-27#
	58-27#	58-30	58-30#	58-30#	58-39	58-39#	58-39#	58-51	58-51#	58-51#	58-65	58-65#	58-65#	58-68
	58-68#	58-68#	58-71	58-71#	58-71#	58-73	58-73#	58-73#	58-84	58-84#	58-84#	58-96	58-96#	58-96#
	58-100	58-100#	58-100#	59-20	59-20#	59-20#	59-23	59-23#	59-23#	59-33	59-33#	59-33#	59-37	59-37#
	59-37#	59-45	59-45#	59-45#	59-56	59-56#	59-56#	59-59	59-59#	59-59#	60-18	60-18#	60-18#	60-21
	60-21#	60-21#	60-24	60-24#	60-24#	60-33	60-33#	60-33#	60-39	60-39#	60-39#	60-57	60-57#	60-57#
	60-66	60-66#	60-66#	60-69	60-69#	60-69#	60-72	60-72#	60-72#	60-81	60-81#	60-81#	60-85	60-85#
	60-85#	61-17	61-17#	61-17#	61-20	61-20#	61-20#	61-22	61-22#	61-22#	61-46	61-46#	61-46#	61-49
	61-49#	61-49#	61-52	61-52#	61-52#	61-79	61-79#	61-79#	61-82	61-82#	61-82#	61-85	61-85#	61-85#
	61-88	61-88#	61-88#	62-11	62-11#	62-11#	62-21	62-21#	62-21#	62-24	62-24#	62-24#	62-27	62-27#
	62-27#	62-34	62-34#	62-34#	62-36	62-36#	62-36#	64-12	64-12#	64-12#	64-15	64-15#	64-15#	64-18
	64-18#	64-18#	64-27	64-27#	64-27#	65-28	65-28#	65-28#	65-56	65-56#	65-56#	65-80	65-80#	65-80#
	65-97	65-97#	65-97#	65-100	65-100#	65-100#	65-103	65-103#	65-103#	65-110	65-110#	65-110#	65-127	65-127#
	65-127#	65-130	65-130#	65-130#	65-137	65-137#	65-137#	67-25	67-25#	67-25#	67-37	67-37#	67-37#	67-40
	67-40#	67-40#	67-43	67-43#	67-43#	67-47	67-47#	67-47#	67-51	67-51#	67-51#	68-91	68-91#	68-91#
	68-104	68-104#	68-104#	68-107	68-107#	68-107#	68-110	68-110#	68-110#	68-128	68-128#	68-128#	68-134	68-134#
	68-134#	68-137	68-137#	68-137#	70-60	70-60#	70-60#	70-66	70-66#	70-66#	70-68	70-68#	70-68#	71-56
	71-56#	71-56#	72-35	72-35#	72-35#	73-36	73-36#	73-36#	74-34	74-34#	74-34#			
T$GMAN	14-16#													
T$HILI	75-15	75-15#	75-16	75-16#	75-17	75-17#	76-15	76-15#						
T$LAST	14-16#	76-32#												
T$LOLI	75-15	75-15#	75-16	75-16#	75-17	75-17#	76-15	76-15#						
T$LSYM	14-16	14-16#	17-24	18-12	42-24	42-34	42-65	42-101	42-109	42-115	42-120	42-124	42-130	45-171

	46-28	47-16	48-262	48-362	48-371	49-13	51-47	51-60	53-56	·160	53-195	53-197	54-51	56-48
	56-81	56-83	56-107	57-48	57-85	57-86	57-111	58-44	58-60	58-78	58-102	58-106	59-50	59-69
	59-71	59-77	60-61	60-105	60-106	60-111	61-41	61-74	61-107	61-109	62-48	64-44	65-40	65-68
	65-92	65-122	65-149	65-151	67-134	68-258	70-83	71-68	72-48	73-53	74-47	75-19	76-17	
T$LTNO	76-32#													
T$NEST	14-16#	14-19	14-19	14-19#	17-10	17-10	17-10#	17-24	17-24	17-24	17-24#	18-8	18-8	18-8#
	18-12	18-12	18-12	18-12#	42-8	42-8	42-8#	42-24	42-24	42-24	42-24#	42-27	42-27	42-27#
	42-34	42-34	42-34	42-34#	42-36	42-36	42-36#	42-65	42-65	42-65	42-65#	42-68	42-68	42-68#
	42-101	42-101	42-101	42-101#	42-105	42-105	42-105#	42-109	42-109	42-109	42-109#	42-111	42-111	42-111#
	42-115	42-115	42-115	42-115#	42-118	42-118	42-118#	42-120	42-120	42-120	42-120#	42-122	42-122	42-122#
	42-124	42-124	42-124	42-124#	42-126	42-126	42-126#	42-130	42-130	42-130	42-130#	44-8	44-8	44-8#
	44-14	44-14	44-14	44-14#	45-8	45-8	45-8#	45-171	45-171	45-171	45-171#	46-8	46-8	46-8#
	46-28	46-28	46-28	46-28#	47-9	47-9	47-9#	47-16	47-16	47-16	47-16#	48-9	48-9	48-9#
	48-262	48-262	48-262	48-262#	48-267	48-267	48-267#	48-362	48-362	48-362	48-362#	48-367	48-367	48-367#
	48-371	48-371	48-371	48-371#	49-8	49-8	49-8#	49-13	49-13	49-13	49-13#	51-19	51-19	51-19#
	51-47	51-47	51-47	51-47#	51-50	51-50	51-50#	51-60	51-60	51-60	51-60#	53-32	53-32	53-32#
	53-33	53-33	53-33#	53-56	53-56	53-56	53-56#	53-59	53-59	53-59#	53-160	53-160	53-160	53-160#
	53-162	53-162	53-162#	53-195	53-195	53-195	53-195#	53-197	53-197	53-197	53-197#	54-29	54-29	54-29#
	54-51	54-51	54-51	54-51#	56-17	56-17	56-17#	56-18	56-18	56-18#	56-48	56-48	56-48	56-48#
	56-50	56-50	56-50#	56-81	56-81	56-81	56-81#	56-83	56-83	56-83	56-83#	56-85	56-85	56-85#
	56-107	56-107	56-107	56-107#	57-16	57-16	57-16#	57-17	57-17	57-17#	57-48	57-48	57-48	57-48#
	57-50	57-50	57-50#	57-85	57-85	57-85	57-85#	57-86	57-86	57-86	57-86#	57-88	57-88	57-88#
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	58-46	58-46	58-46#	58-60	58-60	58-60	58-60#	58-62	58-62	58-62#	58-78	58-78	58-78	58-78#
	58-80	58-80	58-80#	58-102	58-102	58-102	58-102#	58-106	58-106	58-106	58-106#	59-15	59-15	59-15#
	59-17	59-17	59-17#	59-50	59-50	59-50	59-50#	59-52	59-52	59-52#	59-69	59-69	59-69	59-69#
	59-71	59-71	59-71	59-71#	59-75	59-75	59-75#	59-77	59-77	59-77	59-77#	60-14	60-14	60-14#
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	61-76	61-76	61-76#	61-107	61-107	61-107	61-107#	61-109	61-109	61-109	61-109#	62-8	62-8	62-8#
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	65-16	65-16	65-16#	65-40	65-40	65-40	65-40#	65-42	65-42	65-42#	65-68	65-68	65-68	65-68#
	65-70	65-70	65-70#	65-92	65-92	65-92	65-92#	65-94	65-94	65-94#	65-122	65-122	65-122	65-122#
	65-124	65-124	65-124#	65-149	65-149	65-149	65-149#	65-151	65-151	65-151	65-151#	67-11	67-11	67-11#
	67-134	67-134	67-134	67-134#	68-12	68-12	68-12#	68-258	68-258	68-258	68-258#	70-46	70-46	70-46#
	70-83	70-83	70-83	70-83#	71-46	71-46	71-46#	71-68	71-68	71-68	71-68#	72-24	72-24	72-24#
	72-48	72-48	72-48	72-48#	73-24	73-24	73-24#	73-53	73-53	73-53	73-53#	74-23	74-23	74-23#
	74-47	74-47	74-47	74-47#	75-13	75-13	75-13#	75-19	75-19	75-19	75-19#	76-13	76-13	76-13#
	76-17	76-17	76-17	76-17#	76-30	76-30	76-30	76-30#						
T$NS0	14-19#	76-30												
T$NS1	17-10#	17-24	18-8#	18-12	42-8#	42-24	42-27#	42-34	42-36#	42-65	42-68#	42-101	42-105#	42-109
	42-111#	42-115	42-118#	42-120	42-122#	42-124	42-126#	42-130	44-8#	44-14	45-8#	45-171	46-8#	46-28
	47-9#	47-16	48-9#	48-262	48-267#	48-362	48-367#	48-371	49-8#	49-13	51-19#	51-47	51-50#	51-60
	53-32#	53-197	54-29#	54-51	56-17#	56-83	56-85#	56-107	57-16#	57-86	57-88#	57-111	58-20#	58-106
	59-15#	59-71	59-75#	59-77	60-14#	60-106	60-109#	60-111	61-13#	61-109	62-8#	62-48	64-9#	64-44
	65-15#	65-151	67-11#	67-134	68-12#	68-258	70-46#	70-83	71-46#	71-68	72-24#	72-48	73-24#	73-53
	74-23#	74-47	75-13#	75-19	76-13#	76-17								
T$NS2	53-33#	53-56	53-59#	53-160	53-162#	53-195	56-18#	56-48	56-50#	56-81	57-17#	57-48	57-50#	57-85
	58-21#	58-44	58-46#	58-60	58-62#	58-78	58-80#	58-102	59-17#	59-50	59-52#	59-69	60-15#	60-61
	60-63#	60-105	61-14#	61-41	61-43#	61-74	61-76#	61-107	65-16#	65-40	65-42#	65-68	65-70#	65-92
	65-94#	65-122	65-124#	65-149										
T$PTNU	14-16#													
T$SAVL	14-16#													
T$SEGL	14-16#													
T$SUBN	14-16#	51-19#	53-32#	53-33	53-33	53-33#	53-59	53-59	53-59#	53-162	53-162	53-162#	54-29#	56-17#
	56-18	56-18	56-18#	56-50	56-50	56-50#	57-16#	57-17	57-17	57-17#	57-50	57-50	57-50#	58-20#

	58-21	58-21	58-21#	58-46	58-46	58-46#	58-62	58-62	58-62#	58-80	58-80	58-80#	59-15#	59-17
	59-17	59-17#	59-52	59-52	59-52#	60-14#	60-15	60-15	60-15#	60-63	60-63	60-63#	61-13#	61-14
	61-14	61-14#	61-43	61-43	61-43#	61-76	61-76	61-76#	62-8#	64-9#	65-15#	65-16	65-16	65-16#
	65-42	65-42	65-42#	65-70	65-70	65-70#	65-94	65-94	65-94#	65-124	65-124	65-124#	67-11#	68-12#
	70-46#	71-46#	72-24#	73-24#	74-23#									
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	42-36	42-36#	42-68	42-68	42-68#	42-105	42-105	42-105#	42-111	42-111	42-111#	42-118	42-118	42-118#
	42-122	42-122	42-122#	42-126	42-126	42-126#	44-8	44-8	44-8#	45-8	45-8	45-8#	46-8	46-8
	46-8#	47-9	47-9	47-9#	48-9	48-9	48-9#	48-267	48-267	48-267#	48-367	48-367	48-367#	49-8
	49-8	49-8#	51-19	51-19	51-19#	51-50	51-50	51-50#	53-32	53-32	53-32#	53-33	53-33	53-33#
	53-59	53-59	53-59#	53-162	53-162	53-162#	54-29	54-29	54-29#	56-17	56-17	56-17#	56-18	56-18
	56-18#	56-50	56-50	56-50#	56-85	56-85	56-85#	57-16	57-16	57-16#	57-17	57-17	57-17#	57-50
	57-50	57-50#	57-88	57-88	57-88#	58-20	58-20	58-20#	58-21	58-21	58-21#	58-46	58-46	58-46#
	58-62	58-62	58-62#	58-80	58-80	58-80#	59-15	59-15	59-15#	59-17	59-17	59-17#	59-52	59-52
	59-52#	59-75	59-75	59-75#	60-14	60-14	60-14#	60-15	60-15	60-15#	60-63	60-63	60-63#	60-109
	60-109	60-109#	61-13	61-13	61-13#	61-14	61-14	61-14#	61-43	61-43	61-43#	61-76	61-76	61-76#
	62-8	62-8	62-8#	64-9	64-9	64-9#	65-15	65-15	65-15#	65-16	65-16	65-16#	65-42	65-42
	65-42#	65-70	65-70	65-70#	65-94	65-94	65-94#	65-124	65-124	65-124#	67-11	67-11	67-11#	68-12
	68-12	68-12#	70-46	70-46	70-46#	71-46	71-46	71-46#	72-24	72-24	72-24#	73-24	73-24	73-24#
	74-23	74-23	74-23#	75-13	75-13	75-13#	76-13	76-13	76-13#					
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	16-8	16-8	16-8	16-8	16-8	16-8	16-8	16-8	16-8	16-8	16-8	16-8	16-8	16-8
	16-8#	16-8#	16-8#	16-8#	16-8#	16-8#	16-8#	16-8#	16-8#	16-8#	16-8#	16-8#	16-8#	16-8#
	16-8#	16-8#	17-24	17-24#	18-12	18-12#	42-24	42-24#	42-34	42-34#	42-65	42-65#	42-101	42-101#
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	46-28	46-28#	47-16	47-16#	48-262	48-262#	48-362	48-362#	48-371	48-371#	49-13	49-13#	51-47	51-47#
	51-60	51-60#	53-56	53-56#	53-160	53-160#	53-195	53-195#	53-197	53-197#	54-32	54-32#	54-41	54-41#
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	57-42	57-42#	57-48	57-48#	57-53	57-53#	57-57	57-57#	57-60	57-60#	57-69	57-69#	57-71	57-71#
	57-85	57-85#	57-86	57-86#	57-111	57-111#	58-24	58-24#	58-27	58-27#	58-30	58-30#	58-39	58-39#
	58-44	58-44#	58-51	58-51#	58-60	58-60#	58-65	58-65#	58-68	58-68#	58-71	58-71#	58-73	58-73#
	58-78	58-78#	58-84	58-84#	58-96	58-96#	58-100	58-100#	58-102	58-102#	58-106	58-106#	59-20	59-20#
	59-23	59-23#	59-33	59-33#	59-37	59-37#	59-45	59-45#	59-50	59-50#	59-56	59-56#	59-59	59-59#
	59-69	59-69#	59-71	59-71#	59-77	59-77#	60-18	60-18#	60-21	60-21#	60-24	60-24#	60-33	60-33#
	60-39	60-39#	60-57	60-57#	60-61	60-61#	60-66	60-66#	60-69	60-69#	60-72	60-72#	60-81	60-81#
	60-85	60-85#	60-105	60-105#	60-106	60-106#	60-111	60-111#	61-17	61-17#	61-20	61-20#	61-22	61-22#
	61-41	61-41#	61-46	61-46#	61-49	61-49#	61-52	61-52#	61-74	61-74#	61-79	61-79#	61-82	61-82#
	61-85	61-85#	61-88	61-88#	61-107	61-107#	61-109	61-109#	62-11	62-11#	62-21	62-21#	62-24	62-24#
	62-27	62-27#	62-34	62-34#	62-36	62-36#	62-48	62-48#	64-12	64-12#	64-15	64-15#	64-18	64-18#
	64-27	64-27#	64-44	64-44#	65-28	65-28#	65-40	65-40#	65-56	65-56#	65-68	65-68#	65-80	65-80#
	65-92	65-92#	65-97	65-97#	65-100	65-100#	65-103	65-103#	65-110	65-110#	65-122	65-122#	65-127	65-127#
	65-130	65-130#	65-137	65-137#	65-149	65-149#	65-151	65-151#	67-25	67-25#	67-37	67-37#	67-40	67-40#
	67-43	67-43#	67-47	67-47#	67-51	67-51#	67-134	67-134#	68-91	68-91#	68-104	68-104#	68-107	68-107#
	68-110	68-110#	68-128	68-128#	68-134	68-134#	68-137	68-137#	68-258	68-258#	70-60	70-60#	70-66	70-66#
	70-68	70-68#	70-83	70-83#	71-56	71-56#	71-68	71-68#	72-35	72-35#	72-48	72-48#	73-36	73-36#
	73-53	73-53#	74-34	74-34#	74-47	74-47#	75-15	75-15	75-15	75-15#	75-15#	75-15#	75-16	75-16
	75-16	75-16#	75-16#	75-16#	75-17	75-17	75-17	75-17#	75-17#	75-17#	75-19	75-19#	76-15	76-15
	76-15	76-15#	76-15#	76-15#	76-17	76-17#	76-30	76-30#						
T$TEST	14-16#	51-19	51-19	51-19#	53-32	53-32	53-32#	53-33	53-59	53-162	54-29	54-29	54-29#	56-17
	56-17	56-17#	56-18	56-50	57-16	57-16	57-16#	57-17	57-50	58-20	58-20	58-20#	58-21	58-46
	58-62	58-80	59-15	59-15	59-15#	59-17	59-52	60-14	60-14	60-14#	60-15	60-63	61-13	61-13
	61-13#	61-14	61-43	61-76	62-8	62-8	62-8#	64-9	64-9	64-9#	65-15	65-15	65-15#	65-16
	65-42	65-70	65-94	65-124	67-11	67-11	67-11#	68-12	68-12	68-12#	70-46	70-46	70-46#	71-46
	71-46	71-46#	72-24	72-24	72-24#	73-24	73-24	73-24#	74-23	74-23	74-23#	76-32		

T$TSTM	14-16#	28-58	28-65	28-73	28-76	28-82	29-46	29-52	30-70	30-76	32-56	32-61	32-66	35-54
	37-31	37-36	40-38	40-48	40-113	40-114	41-38	41-45	41-59	41-81	41-96	41-117	42-9	42-10
	42-11	42-12	42-13	42-22	42-23	42-24	42-30	42-32	42-33	42-34	42-39	42-41	42-46	42-51
	42-54	42-59	42-63	42-65	42-71	42-78	42-85	42-92	42-99	42-101	42-106	42-107	42-108	42-109
	42-112	42-113	42-114	42-115	42-119	42-120	42-123	42-124	42-129	42-130	45-10	45-25	45-27	45-29
	45-31	45-33	45-48	45-55	45-76	45-93	45-94	45-163	45-171	46-10	46-21	46-24	46-25	46-28
	47-16	48-37	48-272	48-283	48-294	48-303	48-334	48-339	48-345	49-10	49-11	49-13	51-21	51-41
	51-42	51-45	51-47	51-55	51-58	53-33	53-40	53-46	53-56	53-59	53-138	53-140	53-150	53-152
	53-160	53-162	53-182	53-184	53-195	53-197	54-32	54-35	54-41	54-49	54-51	56-18	56-21	56-25
	56-31	56-46	56-48	56-50	56-53	56-58	56-64	56-79	56-81	56-83	56-88	56-92	56-97	56-101
	56-105	56-107	57-17	57-20	57-24	57-27	57-29	57-33	57-40	57-42	57-46	57-48	57-50	57-53
	57-57	57-60	57-69	57-71	57-83	57-85	57-86	57-89	57-90	57-93	57-97	57-101	57-105	57-109
	57-111	58-21	58-24	58-27	58-30	58-35	58-39	58-42	58-44	58-46	58-51	58-56	58-60	58-62
	58-65	58-68	58-71	58-73	58-76	58-78	58-80	58-84	58-96	58-100	58-102	58-106	59-17	59-20
	59-23	59-33	59-37	59-42	59-45	59-50	59-52	59-56	59-59	59-64	59-69	59-71	59-76	59-77
	60-15	60-18	60-21	60-24	60-33	60-39	60-47	60-52	60-57	60-61	60-63	60-66	60-69	60-72
	60-81	60-85	60-88	60-93	60-102	60-105	60-106	60-110	60-111	61-14	61-17	61-20	61-22	61-32
	61-37	61-41	61-43	61-46	61-49	61-52	61-64	61-69	61-74	61-76	61-79	61-82	61-85	61-88
	61-98	61-103	61-107	61-109	62-11	62-21	62-24	62-27	62-34	62-36	62-39	62-44	62-48	64-12
	64-15	64-18	64-27	64-30	64-36	64-44	65-16	65-28	65-31	65-36	65-40	65-42	65-56	65-59
	65-64	65-68	65-70	65-80	65-83	65-88	65-92	65-94	65-97	65-100	65-103	65-110	65-113	65-118
	65-122	65-124	65-127	65-130	65-137	65-140	65-145	65-149	65-151	67-25	67-37	67-40	67-43	67-47
	67-51	67-58	67-68	67-74	67-79	67-87	67-93	67-98	67-112	67-115	67-134	68-15	68-18	68-33
	68-58	68-82	68-85	68-86	68-91	68-104	68-107	68-110	68-128	68-134	68-137	68-141	68-148	68-154
	68-159	68-164	68-170	68-175	68-198	68-235	68-245	68-250	68-251	68-258	70-60	70-66	70-68	70-83
	71-56	71-68	72-35	72-48	73-36	73-53	74-34	74-47						
T$TSTS	14-16#	51-19#	53-32#	54-29#	56-17#	57-16#	58-20#	59-15#	60-14#	61-13#	62-8#	64-9#	65-15#	67-11#
	68-12#	70-46#	71-46#	72-24#	73-24#	74-23#								
T1	16-8	51-19#												
T10	16-8	62-8#												
T11	16-8	64-9#												
T12	16-8	65-15#												
T12.1	65-16#													
T12.2	65-42#													
T12.3	65-70#													
T12.4	65-94#													
T12.5	65-124#													
T13	16-8	67-11#												
T14	16-8	68-12#												
T15	16-8	70-46#												
T16	16-8	71-46#												
T17	16-8	72-24#												
T18	16-8	73-24#												
T19	16-8	74-23#												
T2	16-8	53-32#												
T2.1	53-33#													
T2.2	53-59#													
T2.3	53-162#													
T3	16-8	54-29#												
T4	16-8	56-17#												
T4.1	56-18#													
T4.2	56-50#													
T5	16-8	57-16#												
T5.1	57-17#													
T5.2	57-50#													
T6	16-8	58-20#												
T6.1	58-21#													

T6.2	58-46#									
T6.3	58-62#									
T6.4	58-80#									
T7	16-8	59-15#								
T7.1	59-17#									
T7.2	59-52#									
T8	16-8	60-14#								
T8.1	60-15#									
T8.2	60-63#									
T9	16-8	61-13#								
T9.1	61-14#									
T9.2	61-43#									
T9.3	61-76#									
TBUF	20-168#	60-36	60-82	61-59	62-32	64-24	65-107	67-49	67-72	67-102
TCOUNT	20-167#	60-36	60-82	61-59	62-32	64-24	67-49	67-77		
TEMP	20-98#	28-44*	28-69	28-80						
TFLAG	20-166#	67-21*	67-66	67-71*	67-126	68-112*	68-146	68-151*	68-207	68-217*
TH1L	19-125#	57-76	57-95	57-97						
TH2L	19-126#	57-78	57-99	57-101						
TH3L	19-127#	57-74	57-103	57-105						
TH4L	19-128#	57-80	57-107	57-109						
THRESH	19-100#	57-67	60-31	60-79	62-19					
TIMER	19-99#	57-58	62-22							
TOLONG	19-76#	64-33								
TOUT	19-81#	62-42								
TSEL4	68-120*	68-132#	68-152	68-228*						
TSEL6	68-121*	68-133#	68-157	68-229*						
UAM	19-8#									
UPDATE	19-98#	41-111								
WAIT1	20-81#	28-49	45-113*							
WAIT2	20-83#	29-39	30-63	45-116*						
WAIT3	20-85#	41-40	45-118*							
WAIT4	20-86#	41-40*	41-57*							
WMAINT	20-67#	39-25	45-166*	45-169*	48-205	70-47				
WMODEM	19-94#	33-54	39-42	48-31	48-207	59-30	59-54	62-30		
WTYPE	20-32#	45-50*								
X	19-123#	56-43	56-76	56-103	56-105					
X$ALWA	14-16#									
X$FALS	14-16#									
X$OFFS	14-16#									
X$TRUE	14-16#									
XMTBUF	20-189#	40-94*	40-120*	40-125*	40-128	40-152	40-183	40-184	41-35	41-37	41-66

BACCIR	26-6#	61-57	61-86	64-19	65-77	65-101	65-134	67-45							
BACCIT	26-32#	60-36	60-82	61-59	61-93	62-32	64-24	65-107	67-49						
BASEIN	24-6#	56-23	56-56	57-22	57-36	57-55	58-25	58-47	58-66	59-21	60-19	60-67	61-18	61-27	
	61-47	61-80	62-12	64-13	65-20	65-25	65-98	65-128	70-64						
BCOMPL	1-15#	14-16#	45-28	45-30	45-32										
BERROR	1-19#	14-16#	31-55	31-75	37-24	37-26	37-28	67-55							
BGNAU	1-23#	14-16#													
BGNAUT	1-31#	14-16#	46-8												
BGNCLN	1-39#	14-16#	47-9												
BGNDU	1-47#	14-16#	49-8												
BGNHRD	1-55#	14-16#	75-13												
BGNHW	1-66#	14-16#	17-10												
BGNINI	1-77#	14-16#	45-8												
BGNMOD	1-85#	14-16#	14-19												
BGNMSG	1-98#	14-16#	42-8	42-27	42-36	42-68	42-105	42-111	42-118	42-122	42-126	56-85	57-88	59-75	
	60-109														
BGNPRO	1-106#	14-16#	44-8												
BGNPTA	1-114#	14-16#													
BGNRPT	1-144#	14-16#													
BGNSEG	1-152#	14-16#													
BGNSET	1-161#	14-16#													
BGNSFT	1-182#	14-16#	76-13												
BGNSRV	1-193#	14-16#	48-9	48-267	48-367	51-50									
BGNSUB	1-201#	14-16#	53-33	53-59	53-162	56-18	56-50	57-17	57-50	58-21	58-46	58-62	58-80	59-17	
	59-52	60-15	60-63	61-14	61-43	61-76	65-16	65-42	65-70	65-94	65-124				
BGNSW	1-225#	14-16#	18-8												
BGNTST	1-236#	14-16#	51-19	53-32	54-29	56-17	57-16	58-20	59-15	60-14	61-13	62-8	64-9	65-15	
	67-11	68-12	70-46	71-46	72-24	73-24	74-23								
BNCOMP	1-266#	14-16#	45-34	45-49											
BNERRO	1-270#	14-16#	31-43	32-40	32-55	33-50	34-36								
BREAK	1-274#	14-16#	28-58	29-46	30-70	41-45									
BRESET	1-278#	14-16#	49-10												
CALL	23-24#	39-41	48-169	53-42	53-81	53-85	53-167	58-92	58-97	67-33	67-39	67-132	68-100	68-106	
	68-124	68-130	68-254	70-56	70-74	71-52	71-58	72-31	72-37	72-45	73-32	73-38	73-46	74-30	
	74-36	74-44													
CKLOOP	1-282#	14-16#													
CLEAR	23-68#	54-30	54-39	56-19	56-51	57-18	57-51	58-22	58-63	58-82	59-18	60-16	60-64	61-15	
	61-44	61-77	62-9	64-10	65-18	65-44	65-72	65-95	65-125	67-23	68-89	70-58	71-54	72-33	
	73-34	74-32													
CLOCK	1-286#	14-16#													
CLOSE	1-292#	14-16#													
CLRVEC	1-296#	14-16#	40-113	45-25	46-21	51-45	68-18	68-82	68-245						
CNTRIN	24-34#	58-28	58-49	58-69	58-101	60-22	60-70	61-50	61-83	62-25	64-16	65-53	67-42	68-109	
COMMEN	1-301#	14-16#													
DELAY	1-322#	14-16#	28-61	29-49	30-73	41-54									
DESCRI	1-317#	14-16#	22-18												
DEVTYP	1-341#	14-16#	22-13												
DISPAT	1-346#	14-16#	16-8												
DISPLA	1-360#	14-16#													
DMRIN	25-5#	41-111	57-25	57-38	57-58	57-67	59-54	60-31	60-79	62-19	62-22	62-30			
DOCLN	1-376#	14-16#	46-25	51-42											
DODU	1-380#	14-16#	46-24	51-41											
DORPT	1-385#	14-16#													
ENDAU	1-389#	14-16#													
ENDAUT	1-401#	14-16#	46-28												
ENDCLN	1-413#	14-16#	47-16												

ENDCOM	1-425#	14-16#												
ENDDU	1-441#	14-16#	49-13											
ENDHRD	1-453#	14-16#	75-19											
ENDHW	1-465#	14-16#	17-24											
ENDINI	1-475#	14-16#	45-171											
ENDMOD	1-487#	14-16#	76-30											
ENDMSG	1-500#	14-16#	42-24	42-34	42-65	42-101	42-109	42-115	42-120	42-124	42-130	56-107	57-111	59-77
	60-111													
ENDPRO	1-512#	14-16#	44-14											
ENDPTA	1-520#	14-16#												
ENDRPT	1-529#	14-16#												
ENDSEG	1-541#	14-16#												
ENDSET	1-555#	14-16#												
ENDSFT	1-568#	14-16#	76-17											
ENDSRV	1-580#	14-16#	48-262	48-362	48-371	51-60								
ENDSUB	1-596#	14-16#	53-56	53-160	53-195	56-48	56-81	57-48	57-85	58-44	58-60	58-78	58-102	59-50
	59-69	60-61	60-105	61-41	61-74	61-107	65-40	65-68	65-92	65-122	65-149			
ENDSW	1-614#	14-16#	18-12											
ENDTST	1-624#	14-16#	51-47	53-197	54-51	56-83	57-86	58-106	59-71	60-106	61-109	62-48	64-44	65-151
	67-134	68-258	70-83	71-68	72-48	73-53	74-47							
EQUALS	1-642#	14-16#	19-8											
ERRDF	1-714#	14-16#	28-65	28-76	29-52	30-76	32-61	32-66	37-31	37-36	41-59	41-81	41-96	48-37
	48-272	48-283	48-294	48-303	48-334	48-339	48-345	51-55	53-138	53-150	53-182	54-49	56-31	56-46
	56-64	56-79	57-33	57-46	57-83	58-35	58-42	58-56	58-76	59-42	59-64	60-47	60-52	60-88
	60-93	60-102	61-32	61-37	61-64	61-69	61-98	61-103	62-39	62-44	64-30	64-36	65-31	65-36
	65-59	65-64	65-83	65-88	65-113	65-118	65-140	65-145	67-58	67-68	67-74	67-79	67-87	67-93
	67-98	67-112	67-115	68-85	68-141	68-148	68-154	68-159	68-164	68-170	68-175	68-198	68-250	
ERRHRD	1-718#	14-16#												
ERROR	1-722#	14-16#												
ERRSF	1-726#	14-16#												
ERRSOF	1-730#	14-16#	35-54											
ERRTBL	1-734#	14-16#												
ESCAPE	1-744#	14-16#	54-32	54-41	56-21	56-25	56-53	56-58	57-20	57-24	57-27	57-29	57-40	57-42
	57-53	57-57	57-60	57-69	57-71	58-24	58-27	58-30	58-39	58-51	58-65	58-68	58-71	58-73
	58-84	58-96	58-100	59-20	59-23	59-33	59-37	59-45	59-56	59-59	60-18	60-21	60-24	60-33
	60-39	60-57	60-66	60-69	60-72	60-81	60-85	61-17	61-20	61-22	61-46	61-49	61-52	61-79
	61-82	61-85	61-88	62-11	62-21	62-24	62-27	62-34	62-36	64-12	64-15	64-18	64-27	65-28
	65-56	65-80	65-97	65-100	65-103	65-110	65-127	65-130	65-137	67-25	67-37	67-40	67-43	67-47
	67-51	68-91	68-104	68-107	68-110	68-128	68-134	68-137	70-60	70-66	70-68	71-56	72-35	73-36
	74-34													
EXIT	1-771#	14-16#												
FEQUAL	1-810#	14-16#												
GETBYT	1-824#	14-16#												
GETPRI	1-834#	14-16#												
GETWOR	1-829#	14-16#												
GMANIA	1-839#	14-16#												
GMANID	1-848#	14-16#												
GMANIL	1-859#	14-16#												
GPHARD	1-868#	14-16#	45-48											
GPRMA	1-874#	14-16#	75-15	75-16										
GPRMD	1-903#	14-16#	75-17	76-15										
GPRML	1-934#	14-16#												
HEADER	1-954#	14-16#	15-11											
INLOOP	1-962#	14-16#												
IOSETU	1-966#	14-16#												
IOSTAR	1-974#	14-16#												
KT11	1-982#	14-16#												

LASTAD	1-:47#	14-16#	76-32											
MSBYTE	1-D00#	14-16#	15-11	15-11	15-11	15-11#								
MSCHEC	1-E18#	14-16#												
MSCNTO	1-E82#	14-16#	75-15	75-15#	75-16	75-16#	75-17	75-17#	76-15	76-15#				
MSCOUN	1-D66#	14-16#	28-73	28-73#	28-82	28-82#	32-56	32-56#	42-9	42-9#	42-10	42-10	42-10#	42-11
	42-11	42-11#	42-12	42-12#	42-13	42-13#	42-22	42-22	42-22#	42-23	42-23	42-23#	42-30	42-30#
	42-32	42-32	42-32#	42-33	42-33	42-33#	42-39	42-39#	42-41	42-41	42-41#	42-46	42-46#	42-51
	42-51#	42-54	42-54#	42-59	42-59#	42-63	42-63#	42-71	42-71#	42-78	42-78	42-78#	42-85	42-85
	42-85#	42-92	42-92	42-92#	42-99	42-99	42-99#	42-106	42-106#	42-107	42-107	42-107#	42-108	42-108#
	42-112	42-112#	42-113	42-113	42-113#	42-114	42-114	42-114#	42-119	42-119	42-119#	42-123	42-123	42-123#
	42-129	42-129	42-129#	45-55	45-55	45-55#	45-76	45-76	45-76#	45-163	45-163#	49-11	49-11#	51-58
	51-58	51-58#	53-40	53-40#	53-46	53-46	53-46	53-46	53-46#	53-140	53-140	53-140	53-140#	53-152
	53-152	53-152	53-152#	53-184	53-184	53-184	53-184#	54-35	54-35#	56-88	56-88#	56-92	56-92#	56-97
	56-97#	56-101	56-101#	56-105	56-105#	57-89	57-89	57-89#	57-90	57-90#	57-93	57-93#	57-97	57-97#
	57-101	57-101#	57-105	57-105#	57-109	57-109#	59-76	59-76	59-76#	60-110	60-110	60-110#	68-86	68-86#
	68-251	68-251#												
MSDATA	1-B67#	14-16#	15-11	15-11	15-11	15-11	15-11	15-11	15-11	15-11	15-11	15-11	15-11	15-11
	15-11	15-11	15-11	15-11	15-11	15-11	15-11	15-11	15-11	15-11	15-11	15-11	15-11	15-11
	15-11	15-11	15-11	15-11	15-11	15-11	15-11	15-11	15-11	15-11	15-11	15-11	15-11	15-11
	22-13#	22-18	22-18#											
MSDECR	1-D29#	14-16#	17-24	17-24#	18-12	18-12#	42-24	42-24#	42-34	42-34#	42-65	42-65#	42-101	42-101#
	42-109	42-109#	42-115	42-115#	42-120	42-120#	42-124	42-124#	42-130	42-130#	44-14	44-14#	45-171	45-171#
	46-28	46-28#	47-16	47-16#	48-262	48-262#	48-362	48-362#	48-371	48-371#	49-13	49-13#	51-47	51-47#
	51-60	51-60#	53-56	53-56#	53-160	53-160#	53-195	53-195#	53-197	53-197#	54-51	54-51#	56-48	56-48#
	56-81	56-81#	56-83	56-83#	56-107	56-107#	57-48	57-48#	57-85	57-85#	57-86	57-86#	57-111	57-111#
	58-44	58-44#	58-60	58-60#	58-78	58-78#	58-102	58-102#	58-106	58-106#	59-50	59-50#	59-69	59-69#
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	61-74	61-74#	61-107	61-107#	61-109	61-109#	62-48	62-48#	64-44	64-44#	65-40	65-40#	65-68	65-68#
	65-92	65-92#	65-122	65-122#	65-149	65-149#	65-151	65-151#	67-134	67-134#	68-258	68-258#	70-83	70-83#
	71-68	71-68#	72-48	72-48#	73-53	73-53#	74-47	74-47#	75-19	75-19#	76-17	76-17#	76-30	76-30#
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	56-81#	56-83#	56-107#	57-48#	57-85#	57-86#	57-111#	58-44#	58-60#	58-78#	58-102#	58-106#	59-50#	59-69#
	59-71#	59-77#	60-61#	60-105#	60-106#	60-111#	61-41#	61-74#	61-107#	61-109#	62-48#	64-44#	65-40#	65-68#
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	48-272	48-272#	48-283	48-283#	48-294	48-294#	48-303	48-303#	48-334	48-334#	48-339	48-339#	48-345	48-345#
	51-55	51-55#	53-138	53-138#	53-150	53-150#	53-182	53-182#	54-49	54-49#	56-31	56-31#	56-46	56-46#
	56-64	56-64#	56-79	56-79#	57-33	57-33#	57-46	57-46#	57-83	57-83#	58-35	58-35#	58-42	58-42#
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	65-145	65-145#	67-58	67-58#	67-68	67-68#	67-74	67-74#	67-79	67-79#	67-87	67-87#	67-93	67-93#
	67-98	67-98#	67-112	67-112#	67-115	67-115#	68-85	68-85#	68-141	68-141#	68-148	68-148#	68-154	68-154#
	68-159	68-159#	68-164	68-164#	68-170	68-170#	68-175	68-175#	68-198	68-198#	68-250	68-250#		
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	65-137	65-137#	67-25	67-25#	67-37	67-37#	67-40	67-40#	67-43	67-43#	67-47	67-47#	67-51	67-51#
	68-91	68-91#	68-104	68-104#	68-107	68-107#	68-110	68-110#	68-128	68-128#	68-134	68-134#	68-137	68-137#
	70-60	70-60#	70-66	70-66#	70-68	70-68#	71-56	71-56#	72-35	72-35#	73-36	73-36#	74-34	74-34#
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	57-53#	57-57#	57-60#	57-69#	57-71#	58-24#	58-27#	58-30#	58-39#	58-51#	58-65#	58-68#	58-71#	58-73#
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	65-56#	65-80#	65-97#	65-100#	65-103#	65-110#	65-127#	65-130#	65-137#	67-25#	67-37#	67-40#	67-43#	67-47#
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	74-34#													
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MSEXSE	1-D22#	14-16#												
MSEXTJ	1-D18#	14-16#												
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	48-367	48-367#	48-371	48-371#	49-8	49-8#	49-13	49-13#	51-19	51-19#	51-47	51-47#	51-50	51-50#
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	53-195	53-195#	53-197	53-197#	54-29	54-29#	54-51	54-51#	56-17	56-17#	56-18	56-18#	56-48	56-48#
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	42-68#	42-105	42-105#	42-111	42-111#	42-118	42-118#	42-122	42-122#	42-126	42-126#	44-8	44-8#	45-8
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	76-32#													
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65-122#	65-124	65-124#	65-127	65-127	65-127#	65-127#	65-130	65-130	65-130#	65-130#	65-137	65-137	65-137#
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	67-93#	67-93#	67-93#	67-93#	67-93#	67-98	67-98	67-98	67-98	67-98#	67-98#	67-98#	67-98#	67-98#
	67-112	67-112	67-112	67-112	67-112#	67-112#	67-112#	67-112#	67-112#	67-115	67-115	67-115	67-115	67-115#
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	75-17	75-17	75-17	75-17#	75-19	75-19#	76-13	76-13#	76-15	76-15	76-15	76-15	76-15	76-15#
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	65-70	65-70#	65-94	65-94#	65-124	65-124#								
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	53-56	53-56#	53-160	53-160#	53-195	53-195#	53-197	53-197#	54-51	54-51#	56-48	56-48#	56-81	56-81#
	56-83	56-83#	56-107	56-107#	57-48	57-48#	57-85	57-85#	57-86	57-86#	57-111	57-111#	58-44	58-44#
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	65-122	65-122#	65-149	65-149#	65-151	65-151#	67-134	67-134#	68-258	68-258#	70-83	70-83#	71-68	71-68#
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MSHNAP	1-B24#	14-16#	15-11	15-11#										
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	42-68	42-68#	42-68#	42-71#	42-78#	42-85#	42-92#	42-99#	42-101#	42-105	42-105	42-105#	42-105#	42-106#
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	45-33#	45-48#	45-55#	45-76#	45-93#	45-94#	45-163#	45-171#	46-8	46-8	46-8#	46-8#	46-10#	46-21#
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	48-267	48-267#	48-267#	48-272#	48-283#	48-294#	48-303#	48-334#	48-339#	48-345#	48-367	48-367	48-367#	48-367#
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	53-59#	53-59#	53-59#	53-138#	53-140#	53-150#	53-152#	53-160#	53-162	53-162	53-162	53-162#	53-162#	53-162#
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	65-92	65-92#	65-122	65-122#	65-149	65-149#	65-151	65-151#	67-134	67-134#	68-258	68-258#	70-83	70-83#
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