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DMP-11 CZDMICO FICHE 1 OF 2

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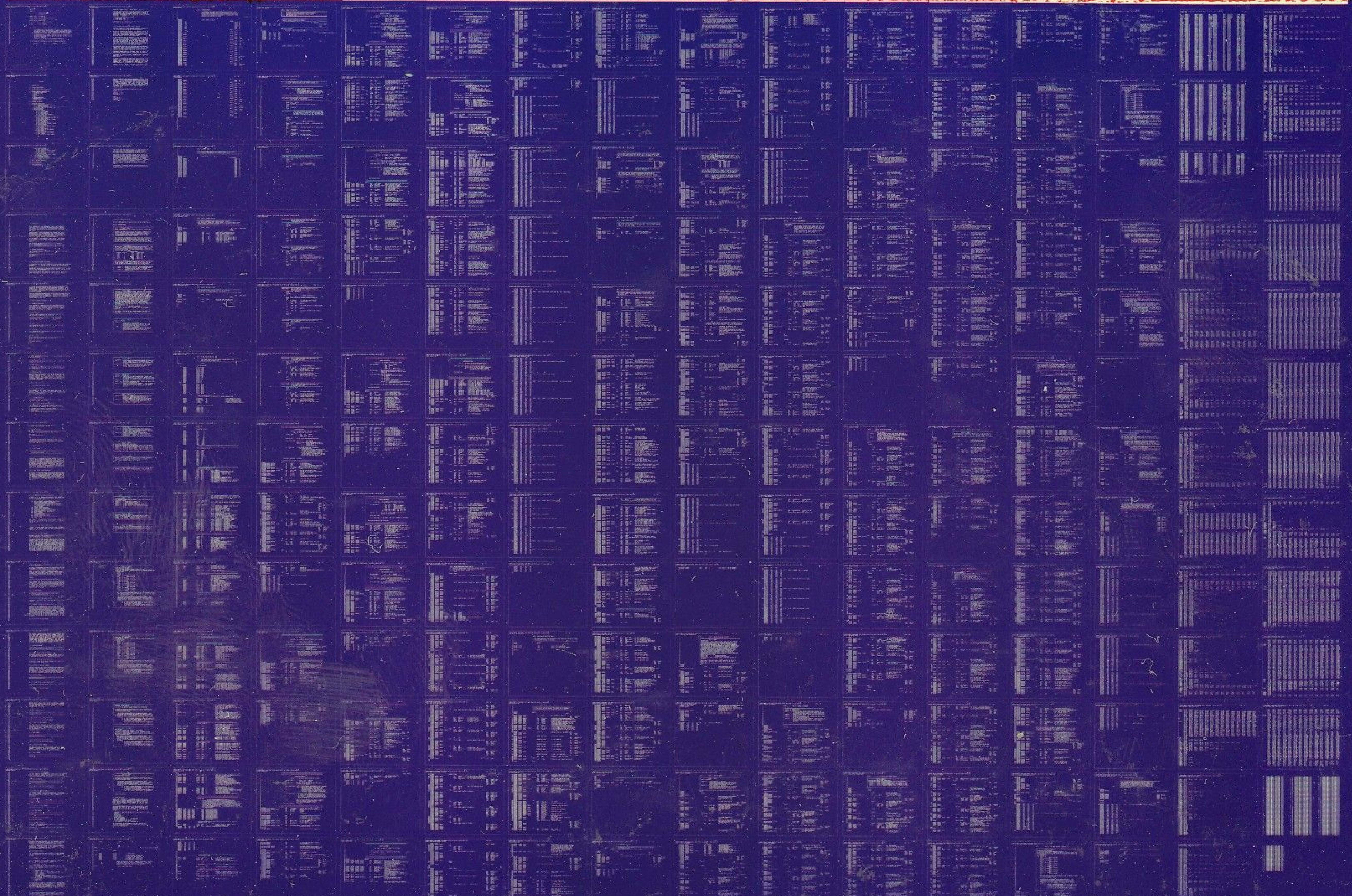

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                                                     IDENTIFICATION
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                                        PRODUCT CODE:    AC-F830C-MC

                                        PRODUCT 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 :

```
DRS LOADED
DIAG. RUN-TIME SERVICES

DR>
```

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

6.3 PROGRAM OPTIONS

6.3.1 START COMMAND

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

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

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

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

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

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

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

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

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

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

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

6.3.1.5 EFFECT OF START COMMAND

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

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

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

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

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

EXAMPLE:

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

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

6.3.2 RESTART COMMAND

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

6.3.2.1 TESTS, PASS, AND FLAGS SWITCHES

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

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

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

6.3.2.3 EFFECT OF RESTART COMMAND

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

6.3.3 CONTINUE COMMAND

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

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

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

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

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

6.3.3.3 EFFECT OF CONTINUE COMMAND

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

6.3.4 PROCEED COMMAND

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

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

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

6.3.4.2 EFFECT OF PROCEED COMMAND

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

6.3.5 ADD COMMAND

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

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

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

6.3.5.2 EFFECT OF ADD COMMAND

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

6.3.6 DROP COMMAND

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

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

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

6.3.6.2 EFFECT OF DROP COMMAND

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

6.3.7 PRINT COMMAND

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

6.3.7.1 EFFECT OF PRINT COMMAND

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

6.3.8 DISPLAY COMMAND

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

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

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

6.3.8.2 EFFECT OF DISPLAY COMMAND

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

6.3.9 FLAGS COMMAND

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

6.3.9.1 EFFECT OF FLAGS COMMAND

THE CURRENT SETTINGS OF ALL FLAGS ARE PRINTED.

6.3.10 ZFLAGS COMMAND

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

6.3.10.1 EFFECT OF ZFLAGS COMMAND

ALL FLAGS ARE CLEARED.

6.3.11 CONTROL CHARACTERS

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

A CONTROL Z (Z) ENTERED DURING ONE OF THE 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 (SEL0) 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 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)
;***********************************************************************




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




                        .EVEN
```

```
      1                                              .SBTTL  DISPATCH TABLE
      2
      3                                              ;///////////////////////////////////////////////////////////////////////////
      4                                              ;/ THE DISPATCH TABLE CONTAINS THE STARTING ADDRESS OF EACH TEST.
      5                                              ;/ IT IS USED BY THE SUPERVISOR TO DISPATCH TO EACH TEST.
      6                                              ;///////////////////////////////////////////////////////////////////////////
      7
      8 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
      9
     16
     17
     18
     19
     20
```

```
                                        .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:
     1                                     .SBTTL  DEFAULT SOFTWARE P-TABLE
     2
     3                                     ;////////////////////////////////////////////////////////////////////////////
     4                                     ;/ THE SOFTWARE P-TABLE CONTAINS THE VALUE OF THE PROGRAM
     5                                     ;/ PARAMETERS THAT CAN BE CHANGED BY THE OPERATOR.
     6                                     ;///////////////////////////////////////////////////////////////////////////
     7
     8 002222                                    BGNSW   SFPTBL
       002222  000001                                                                       .WORD   L10001-L$SW/2
       002224                                                                         L$SW::
       002224                                                                         SFPTBL::
     9
    10 002224  000005                            SPEED:  .WORD   5       ;PROCESSOR SPEED VARIABLE USED
    11                                                                   ;TO ALTER THE WAIT VARIABLES.
    12 002226                                    ENDSW
       002226                                                                         L10001:
    13
    14
    15
    16
    17
```

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

```
000040               PRI01== 40
000000               PRI00== 0
                     ;
                     ;OPERATOR FLAG BITS
                     ;
000004               EVL==         4
000010               LOT==        10
000020               ADR==        20
000040               IDU==        40
000100               ISR==       100
000200               UAM==       200
000400               BOE==       400
001000               PNT==      1000
002000               PRI==      2000
004000               IXE==      4000
010000               IBE==     10000
020000               IER==     20000
040000               LOE==     40000
100000               HOE==    100000
                     ;;*******************************************************************

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

```
010574  005037  002372                  CLR     SUBRPC          ;CLEAR THE PC
010600                          105$:
010600  012601                          MOV     (SP)+,R1        ;RESTORE R1
010602  012600                          MOV     (SP)+,R0        ;RESTORE R0
010604  005737  002360                  TST     ERRFLG          ;WAS THERE AN ERROR (CARRY CLEARED ON TST)
010610  001401                          BEQ     110$            ;IF NOT, RETURN WITH CARRY CLEAR
010612  000261                          SEC                     ;SET CARRY.
010614                          110$:
010614  000207                          RETURN

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

```
                                        ;;**************************************************************************
                                        ;;**************************************************************************
                                        ;
                                        ;                         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.  ADDITONALLY 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,@#SELO  -
011154  000240                          NOP                       ;**************************************

011156  005237  002376                  INC     CLRNO             ;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,@SELO        ;IS THE RUN BIT SET IN SELO?
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 NGT 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 (SELO 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
```

```
    53 011362  062716  000002                  ADD     #2,(SP)         ;INC. POINTER AGAIN (SHOULD BE AT RETURN PC)
    54 011366                                  WAIT    RQI             ;CLEAR RQI AND WAIT FOR RDI TO CLEAR
                                                                       ;**** MACRO EXPANSION ****
       011366  004737  010704                  JSR     PC, $CLRQI      ;CLEAR RQI AND WAIT FOR IT TO BE CLEARED.
                                                                       ;****                   ****
    55 011372                                  BERROR  30$             ;IF ERROR, EXIT
       011372  103445                                                                          BCS     30$
    56 011374  122777  000122  170636          CMPB    #122,@BSEL6     ;WAS THIS A DMR BASE IN?
    57 011402  001004                          BNE     15$             ;IF NOT, CLEAR DMR FLAG (DMC MODE)
    58 011404  032777  010000  170626          BIT     #RES,@SEL6      ;IS THIS A RESUME?
    59 011412  001403                          BEQ     16$             ;IF NOT, PROCEED
    60 011414                          15$:
    61 011414  005037  002260                  CLR     DMRFLG          ;CLEAR DMR FLAG (NO DMR RUN ACKNOWLEDGE).
    62 011420  000432                          BR      30$             ;SKIP - TO END
    63 011422                          16$:
    64 011422  012737  177777  002260          MOV     #-1,DMRFLG      ;FLAG THAT DMR MODE WAS REQUESTED.
    65 011430  005737  002262                  TST     INFACE          ;IS AN INTERFACE WRITE REQUIRED?
    66 011434  001424                          BEQ     30$             ;IF NOT - SKIP TO END
    67 011436  022737  000001  002364          CMP     #CNTRL,ERROR    ;ARE WE EXPECTING AN ERROR (IN TEST THAT
    68                                                                 ;FORCES AN ERROR)
    69 011444  001004                          BNE     17$             ;IF NOT PROCEED
    70 011446  032777  000200  170556          BIT     #RDO,@SEL0      ;IF EXPECTING AN ERROR - IS RDO SET
    71 011454  001014                          BNE     30$             ;IF YES - DON'T BOTHER CHANGING THE INTERFACE.
    72 011456                          17$:
    73 011456  112777  000055  170546          MOVB    #RQI!INTER,@BSEL0 ;ISSUE WRITE INTERFACE COMMAND.
    74 011464                                  WAIT    RDI             ;WAIT FOR RDI
                                                                       ;**** MACRO EXPANSION ****
       011464  004737  010274                  JSR     PC, $WAIT       ;CALL WAIT ROUTINE
       011470  000000                                  .WORD   0       ;FLAG THAT WE'RE WAITING FOR RDI
                                                                       ;****                   ****
    75 011472                                  BERROR  30$             ;IF ERROR, BR TO END.
       011472  103405                                                                          BCS     30$
    76 011474  113777  002304  170546          MOVB    AX3,@BSEL7      ;WRITE AX3-15. INTERFACE SELECTED
    77                                                                 ;BY AX3 DETERMINED IN INIT. CODE.
    78 011502                                  WAIT    RQI             ;CLEAR RQI AND WAIT FOR RDI TO CLEAR.
                                                                       ;**** MACRO EXPANSION ****
       011502  004737  010704                  JSR     PC, $CLRQI      ;CLEAR RQI AND WAIT FOR IT TO BE CLEARED.
                                                                       ;****                   ****
    79 011506                          30$:
    80 011506  005037  002374                  CLR     NESTPC          ;CLEAR THE NEST FLAG
    81 011512  005037  002372                  CLR     SUBPPC          ;TIDY UP SUBRPC
    82 011516  000207                          RETURN
    83
    84
```

```
                                        ;;*******************************************************************
                                        ;;*******************************************************************
                                        ;
                                        ;                          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),@SEL0       ;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
 012506                             40$:
 012506  005737  002374                     TST     NESTPC          ;IS THE ROUTINE NESTED?
 012512  001002                             BNE     45$             ;BR IF YES
 012514  005037  002372                     CLR     SUBRPC          ;CLEAR SAVED PC
 012520                             45$:
 012520  012601                             MOV     (SP)+,R1        ;RESTORE R1
 012522  012600                             MOV     (SP)+,R0        ;RESTORE R0
 012524  000207                             RETURN

 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
                                            .EVEN

```

```
                                        ;;*******************************************************************
                                        ;;*******************************************************************
                                        ;
                                        ;                          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$ERDF
   012664  000004                                                                                       .WORD   4
   012666  012712                                                                                       .WORD   EMS4
   012670  015112                                                                            .WORD   ERRG2
   012672                                 20$:
   012672  042777  000207  167334                  BIC     #RDO!CMD,@SEL2  ;CLEAR RDO AND COMMAND BITS.
   012700  005037  002374                          CLR     NESTPC          ;CLEAR THE NEST FLAG
   012704  005037  002372                          CLR     SUBRPC          ;CLEAR THE PC.
   012710  000207                                  RETURN

   012712     123     110     125         EMS4:    .ASCIZ  /SHUTDOWN ERROR/
   012715     124     104     117
   012720     127     116     040
   012723     105     122     122
   012726     117     122     000
                                                   .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.
```

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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
                                                                                            TRAP    C$BRK
014260  104422
                                                                    ;THE SUPERVISOR TO ALLOW CONSOLE INTERRUPT
                                                                    ;(NOTE: INFLAG AND OUTFLG SET IN THE INTERRUPT
                                                                    ;SERVICE ROUTINES)
014262  005737  002352                     TST     INFLAG           ;ARE THE INPUTS DONE?   (INISR DONE?)
014266  001403                             BEQ     12$              ;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$DLY,(PC)+
014310  000000                                                                            .WORD   0
014312  005367  177772                                                                    DEC     -6(PC)
014316  001375                                                                            BNE     .-4
014320  005367  177756                                                                    DEC     -22(PC)
014324  001367                                                                            BNE     .-20
014326  005301                          DEC     R1              ;CONTINUE IN LOOP UNTIL R1 = 0.
014330  001353                          BNE     10$
014332  005337  002320                  DEC     WAIT4           ;DECREMENT OUTER LOOP COUNTER
014336  001346                          BNE     8$              ;IF NOT DONE - GO THROUGH INNER LOOP AGAIN.
014340                                  ERRDF   2,EMG2,ERRG1    ;TIMEOUT MESSAGE.
014340  104455                                                                            TRAP    C$ERDF
014342  000002                                                                            .WORD   2
014344  017715                                                                            .WORD   EMG2
014346  014604                                                                            .WORD   ERRG1
                                                                ;ALSO PRINT # OF BUFFERS NOT COMPLETE.

014350  000453                          BR      60$             ;EXIT
014352                          20$:

014352  012700  003636                  MOV     #RCVBUF,R0      ;RECEIVE BUFFER POINTER TABLE ADDRESS.
014356  012701  003236                  MOV     #XMTBUF,R1      ;TRANSMIT BUFFERS
014362  013702  002324                  MOV     BUFNUM,R2       ;# OF RCV. AND XMIT BUFFERS.
014366  005737  002302                  TST     MMANAG          ;ARE THE BUFFERS MEMORY MANAGED?
014372  001403                          BEQ     40$             ;IF YES - PROCEED.
014374  012737  000001  177572          MOV     #1,@#177572     ;TURN ON MEMORY MANAGEMENT
014402                          40$:
014402  012003                          MOV     (R0)+,R3        ;ADDRESS OF A RECEIVE BUFFER.
014404  012104                          MOV     (R1)+,R4        ;ADDRESS OF A TRANSMIT BUFFER.
014406  011005                          MOV     @R0,R5          ;CHARACTER COUNT.
014410  022021                          CMP     (R0)+,(R1)+     ;ARE THE CHARACTER COUNTS THE SAME?
014412  001412                          BEQ     45$             ;IF YES - PROCEED.
014414  005737  002302                  TST     MMANAG          ;IS MEMORY MANAGEMENT TURNED ON?
014420  001402                          BEQ     41$             ;IF NOT - SKIP TURN OFF.
014422  005037  177572                  CLR     @#177572        ;TURN OFF MEMORY MANAGEMENT.
014426                          41$:
014426                                  ERRDF   12,EMG12,ERRG10
014426  104455                                                                            TRAP    C$ERDF
014430  000014                                                                            .WORD   12
014432  020127                                                                            .WORD   EMG12
014434  016152                                                                            .WORD   ERRG10
014436  000420                          BR      60$             ;EXIT
014440                          45$:
014440  122324                          CMPB    (R3)+,(R4)+     ;ARE THE CHARACTERS THE SAME?
014442  001005                          BNE     50$             ;IF NOT - ERROR EXIT
014444  005305                          DEC     R5              ;CHECK ALL THE CHARACTERS
014446  001374                          BNE     45$
014450  005302                          DEC     R2              ;CHECK ALL THE BUFFERS.
014452  001353                          BNE     40$
014454  000411                          BR      60$
014456                          50$:
014456  005737  002302                  TST     MMANAG          ;IS MEMORY MANAGEMENT TURNED ON?
014462  001402                          BEQ     51$             ;IF NOT - SKIP TURN OFF.
014464  005037  177572                  CLR     @#177572        ;TURN OFF MEMORY MANAGEMENT.
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
```

```
     1                                      .SBTTL  GLOBAL ERROR REPORT REPORT SECTION
     2                                      ;/////////////////////////////////////////////////////////////////////////////
     3                                      ;/     THE GLOBAL ERROR REPORT SECTION CONTAINS ERROR MESSAGES
     4                                      ;/     THAT ARE USED IN MORE THAN ONE TEST.
     5                                      ;/////////////////////////////////////////////////////////////////////////////
     6                                              .EVEN
     7
     8 014604                               BGNMSG  ERRG1
       014604                                                                            ERRG1::
     9 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$PNTB
       014624  062706  000006                                                                    ADD     #6,SP
    10 014630                                       PRINTB  #FMG1,@SEL0,@SEL2 ;PRINT SEL0 AND SEL2 CONTENTS.
       014630  017746  165400                                                                    MOV     @SEL2,-(SP)
       014634  017746  165372                                                                    MOV     @SEL0,-(SP)
       014640  012746  016270                                                                    MOV     #FMG1,-(SP)
       014644  012746  000003                                                                    MOV     #3,-(SP)
       014650  010600                                                                            MOV     SP,R0
       014652  104414                                                                            TRAP    C$PNTB
       014654  062706  000010                                                                    ADD     #10,SP
    11 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$PNTB
       014704  062706  000010                                                                    ADD     #10,SP
    12 014710                                       PRINTB  #FMG21,BUFNUM    ;# OF BUFFERS
       014710  013746  002324                                                                    MOV     BUFNUM,-(SP)
       014714  012746  017447                                                                    MOV     #FMG21,-(SP)
       014720  012746  000002                                                                    MOV     #2,-(SP)
       014724  010600                                                                            MOV     SP,R0
       014726  104414                                                                            TRAP    C$PNTB
       014730  062706  000006                                                                    ADD     #6,SP
    13 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
    14 014760  005437  002326                       NEG     INRCV            ;NEGATE BUFFER VALUES
    15 014764  005437  002330                       NEG     INXMIT
    16 014770  005437  002332                       NEG     OUTRCV
    17 014774  005437  002334                       NEG     OUTXMT
    18 015000  063737  002324  002326               ADD     BUFNUM,INRCV     ;CALCULATE BUFFERS ASSIGNED.
    19 015006  063737  002324  002330               ADD     BUFNUM,INXMIT
    20 015014  063737  002324  002332               ADD     BUFNUM,OUTRCV    ;CALCULATE BUFFERS RECEIVED.
    21 015022  063737  002324  002334               ADD     BUFNUM,OUTXMT
    22 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$PNTB
   015054  062706  000010                                                                          ADD     #10,SP
   015060                              PRINTB  #FMG24,OUTRCV,OUTXMT
   015060  013746  002334                                                                          MOV     OUTXMT,-(SP)
   015064  013746  002332                                                                          MOV     OUTRCV,-(SP)
   015070  012746  017623                                                                          MOV     #FMG24,-(SP)
   015074  012746  000003                                                                          MOV     #3,-(SP)
   015100  010600                                                                                  MOV     SP,R0
   015102  104414                                                                                  TRAP    C$PNTB
   015104  062706  000010                                                                          ADD     #10,SP
   015110                     ENDMSG
   015110                                                                                   L10002:
   015110  104423                                                                                  TRAP    C$MSG


   015112                     BGNMSG  ERRG2
   015112                                                                                   ERRG2::
   015112  005737  002372              TST     SUBRPC          ;IS THE ERROR IN A SUBROUTINE?
   015116  001412                      BEQ     10$             ;IF NOT, DON'T PRINT SUBR. PC
   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$PNTB
   015140  062706  000006                                                                          ADD     #6,SP
   015144                     10$:
   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$PNTB
   015170  062706  000010                                                                          ADD     #10,SP
   015174                              PRINTB  #FMG2,@SEL4,@SEL6 ;PRINT SEL4 AND SEL2 CONTENTS.
   015174  017746  165040                                                                          MOV     @SEL6,-(SP)
   015200  017746  165032                                                                          MOV     @SEL4,-(SP)
   015204  012746  016322                                                                          MOV     #FMG2,-(SP)
   015210  012746  000003                                                                          MOV     #3,-(SP)
   015214  010600                                                                                  MOV     SP,R0
   015216  104414                                                                                  TRAP    C$PNTB
   015220  062706  000010                                                                          ADD     #10,SP
   015224                     ENDMSG
   015224                                                                                   L10003:
   015224  104423                                                                                  TRAP    C$MSG

   015226                     BGNMSG  ERRG3
   015226                                                                                   ERRG3::
   015226  005737  002372              TST     SUBRPC          ;IS THE ERROR IN A SUBROUTINE?
   015232  001412                      BEQ     10$             ;IF NOT, DON'T PRINT SUBR. PC
   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
```

```
015456                          BGNMSG  ERRG4
015456                                                                  ERRG4::
015456  005737  002372                  TST     SUBRPC          ;IS THE ERROR IN A SUBROUTINE?
015462  001412                          BEQ     10$             ;IF NOT, DON'T PRINT SUBR. PC
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$PNTB
015504  062706  000006                                                                  ADD     #6,SP
015510                          10$:
015510  105737  002641                  TSTB    BASE+3          ;ONLY PRINT NON-ZERO VALUES
015514  001003                          BNE     11$
015516  105737  002644                  TSTB    BASE+6
015522  001416                          BEQ     12$
015524                          11$:
015524                                  PRINTB  #FMG7,<B,BASE+3>,<B,BASE+6>
015524  005046                                                                          CLR     -(SP)
015526  153716  002644                                                                  BISB    BASE+6,(SP)
015532  005046                                                                          CLR     -(SP)
015534  153716  002641                                                                  BISB    BASE+3,(SP)
015540  012746  016510                                                                  MOV     #FMG7,-(SP)
015544  012746  000003                                                                  MOV     #3,-(SP)
015550  010600                                                                          MOV     SP,R0
015552  104414                                                                          TRAP    C$PNTB
015554  062706  000010                                                                  ADD     #10,SP
015560                          12$:
015560  105737  002643                  TSTB    BASE+5
015564  001003                          BNE     13$
015566  105737  002646                  TSTB    BASE+8.
015572  001416                          BEQ     14$
015574                          13$:
015574                                  PRINTB  #FMG8,<B,BASE+5>,<B,BASE+8.>
015574  005046                                                                          CLR     -(SP)
015576  153716  002646                                                                  BISB    BASE+8.,(SP)
015602  005046                                                                          CLR     -(SP)
015604  153716  002643                                                                  BISB    BASE+5,(SP)
015610  012746  016561                                                                  MOV     #FMG8,-(SP)
015614  012746  000003                                                                  MOV     #3,-(SP)
015620  010600                                                                          MOV     SP,R0
015622  104414                                                                          TRAP    C$PNTB
015624  062706  000010                                                                  ADD     #10,SP
015630                          14$:
015630  105737  002642                  TSTB    BASE+4
015634  001003                          BNE     15$
015636  105737  002645                  TSTB    BASE+7
015642  001416                          BEQ     16$
015644                          15$:
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: %O6%A SEL2: %O6%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: %O6%A SEL6: %O6%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: %O6%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
```

```
   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
```

```
         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 %06%A XMIT BUFFER AT %06%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. %06%A AND XMIT ADDR. %06%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
```

```
         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
```

```
     1                                       .SBTTL  INITIALIZE SECTION
     2
     3                                       ;///////////////////////////////////////////////////////////////////////
     4                                       ;/ THE INITIALIZE SECTION CONTAINS THE CODING THAT IS PERFORMED
     5                                       ;/ AT THE BEGINNING OF THE TEST SEQUENCE ON THE NEXT UNIT.
     6                                       ;///////////////////////////////////////////////////////////////////////
     7
     8 020440                                BGNINIT
       020440                                                                                        L$INIT::
     9
    10 020440                                        SETPRI  #PRI07          ;SET DIAGNOSTIC PRIORITY = 7
       020440  012700  000340                                                                                MOV     #PRI07,R0
       020444  104441                                                                                        TRAP    C$SPRI
    11 020446  010637  002370                        MOV     SP,PSTACK       ;STORE BASE LEVEL PROGRAM STACK POINTER
    12 020452  005037  002372                        CLR     SUBRPC          ;CLEAR STORAGE WORD FOR SUBROUTINE PC CALL
    13 020456  005037  002364                        CLR     ERROR           ;CLEAR ERROR FLAGS
    14 020462  005037  002274                        CLR     RESUME          ;CLEAR FLAG USED TO ALLOW BASE IN - RESUME.
    15 020466  005037  002276                        CLR     DMCMDE          ;CLEAR FLAG USED TO INDICATE DMC MODE
    16 020472  005037  002376                        CLR     CLRNO           ;CLEAR WORD USED TO RUN MICRO TESTS ON
    17                                                                       ;EVERY OTHER MASTER CLEAR.
    18 020476  005037  002350                        CLR     NXMFLG          ;FLAG USED TO MARK A NXM DMR ADDRESS.
    19 020502  005737  002264                        TST     FRSTIM          ;IS THIS THE TIME THROUGH AFTER LOAD?
    20 020506  001005                                BNE     1$              ;IF NOT - ERROR TRAP VECTOR ALREADY SAVED
    21 020510  012737  000001  002264                MOV     #1,FRSTIM       ;FLAG THAT WE'VE BEEN THRU THE 1ST TIME
    22 020516  005037  002266                        CLR     FRSPAS          ;CLEAR COUNTER FOR # OF PASSES AFTER LOAD
    23
    24 020522                                1$:
    25 020522                                        CLRVEC  #4              ;ENSURE VECTOR 4 IS IN NORMAL STATE.
       020522  012700  000004                                                                                MOV     #4,R0
       020526  104436                                                                                        TRAP    C$CVEC
    26
    27 020530                                        READEF  #EF.START       ;IS THIS JUST STARTED?
       020530  012700  000040                                                                                MOV     #EF.START,R0
       020534  104447                                                                                        TRAP    C$REFG
    28 020536                                        BCOMPLETE STARST        ;IF YES - BRANCH.
       020536  103416                                                                                        BCS     STARST
    29 020540                                        READEF  #EF.RESTART     ;IS THIS A RESTART ?
       020540  012700  000037                                                                                MOV     #EF.RESTART,R0
       020544  104447                                                                                        TRAP    C$REFG
    30 020546                                        BCOMPLETE STARST        ;IF YES - BRANCH.
       020546  103412                                                                                        BCS     STARST
    31 020550                                        READEF  #EF.NEW         ;IS THIS A NEW PASS?
       020550  012700  000035                                                                                MOV     #EF.NEW,R0
       020554  104447                                                                                        TRAP    C$REFG
    32 020556                                        BCOMPLETE NEWST         ;IF YES - BRANCH
       020556  103410                                                                                        BCS     NEWST
    33 020560                                        READEF  #EF.CONTINUE    ;IS THIS A CONTINUATION?
       020560  012700  000036                                                                                MOV     #EF.CONTINUE,R0
       020564  104447                                                                                        TRAP    C$REFG
    34 020566                                        BNCOMPLETE GETPRM       ;IF NOT - GET PARAMETERS
       020566  103013                                                                                        BCC     GETPRM
    35 020570  000137  021476                        JMP     END             ;OTHERWISE - DON'T INITIALIZE.
    36
    37 020574                                STARST:
    38 020574  005037  002270                        CLR     STARES          ;CLEAR THE FLAG TO SHOW START/RESTART.
    39
    40 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, GET 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
```

```
 125 021256  042737  000020  002304            BIC     #BIT4,AX3          ;SELECT V.35
 126 021264  000427                            BR      30$
 127 021266                          20$:
 128 021266  022737  000002  002254            CMP     #2,DMTURN          ;IS INTEGRAL REQUESTED?
 129 021274  001004                            BNE     22$                ;IF NOT - CONTINUE.
 130 021276  042737  000010  002304            BIC     #BIT3,AX3          ;SELECT INTEGRAL MODEM.
 131 021304  000417                            BR      30$
 132 021306                          22$:
 133 021306  022737  000003  002254            CMP     #3,DMTURN          ;IS EIA REQUESTED?
 134 021314  001004                            BNE     25$                ;IF NOT - CONTINUE.
 135 021316  042737  000100  002304            BIC     #BIT6,AX3          ;SELECT EIA(XYZ).
 136 021324  000407                            BR      30$
 137 021326                          25$:
 138 021326  022737  000004  002254            CMP     #4,DMTURN          ;IS RS422 REQUESTED?
 139 021334  001007                            BNE     35$                ;IF NOT, DON'T ALLOW INTERFACE CHANGE.
 140 021336  042737  000200  002304            BIC     #BIT7,AX3          ;SELECT RS422.
 141 021344                          30$:
 142 021344  012737  000001  002262            MOV     #1,INFACE          ;SET FLAG THAT ALLOWS INTERFACE CHANGE.
 143 021352  000404                            BR      40$
 144 021354                          35$:
 145 021354  005037  002262                    CLR     INFACE             ;CLEAR FLAG - NO INTERFACE CHANGE.
 146 021360  005037  002304                    CLR     AX3                ;CLEAR AX3 BITS
 147 021364                          40$:
 148                                                                      ;*******************************************
 149 021364  005737  002310                    TST     MANUF              ;IS THIS A SPECIAL MANUFACTURING TEST CON.?
 150 021370  001410                            BEQ     42$                ;IF NOT - SET MAINT BIT ONLY FOR MODEM LOOP
 151                                                                      ;*******************************************
 152 021372  022737  000001  002254            CMP     #1,DMTURN          ;IS THIS V.35 WITH SPECIAL CONNECTOR?
 153 021400  001430                            BEQ     45$                ;IF YES - SET WRITE MAINT. BIT
 154 021402  022737  000003  002254            CMP     #3,DMTURN          ;IS THIS EIA WITH SPECIAL CONNECTOR?
 155 021410  001424                            BEQ     45$                ;IF YES - SET WRITE MAINT. BIT
 156 021412                          42$:
 157 021412  022737  000006  002254            CMP     #6,DMTURN          ;IS THIS LOCAL LOOP?
 158 021420  001420                            BEQ     45$                ;IF YES - SET WRITE MAINT. BIT.
 159 021422  022737  000007  002254            CMP     #7,DMTURN          ;IS THIS REMOTE LOOP?
 160 021430  001020                            BNE     50$                ;IF NOT - CLEAR MAINT. BIT FLAG
 161 021432  022737  000001  002270            CMP     #1,STARES          ;IS THIS THE FIRST PASS?
 162 021440  001010                            BNE     45$                ;IF NOT - SKIP MESSAGE
 163 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$PNTB
     021456  062706  000004                                                                      ADD     #4,SP
 164
 165 021462                          45$:
 166 021462  012737  000001  002306            MOV     #1,WMAINT          ;SET FLAG TO WRITE MODEM MAINTENANCE BITS.
 167 021470  000402                            BR      END
 168 021472                          50$:
 169 021472  005037  002306                    CLR     WMAINT             ;CLEAR FLAG - DON'T WRITE MAINT. 1 OR 2.
 170 021476                          END:
 171 021476                          ENDINIT
     021476                                                                          L10014:
     021476  104411                                                                               TRAP    C$INIT
 172 021500     045     101     052  FINIT1: .ASCIZ  /%A** WARNING - WILL ASSUME ADDRESS %06%A (NOT %06%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 RESULTANT TRAP TO VECTOR 04 WILL
                                ; CAUSE THE DEVICE TO BE DROPPED (SEE INTERRUPT ROUTINE 'DROP04').
                                ; OTHERWISE THE MEMORY REFERENCE IS UNEVENTFUL AND THE DEVICE IS READY.
                                ;;****************************************************************************

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$:
```

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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.

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022574                                  80$:
022574  042777  000020  157430                  BIC     #IECLR,@SEL0        ;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$:
022640  112777  000143  157364                  MOVB    #IESET!RQI!BASEI,@SEL0 ;ISSUE A BASE IN.
022646  000527                                  BR      170$                ;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,@BSEL0 ;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,@BSEL0 ;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,@BSEL0 ;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.
```

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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 RDO BIT.
023566  012600                          MOV     (SP)+,R0          ;RESTORE R0
023570                          ENDSRV
023570                                                                                   L10020:
```

```
023570  000002                                                                                  RTI

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

023572                          BGNSRV  NOXMEM
023572                                                                                  NOXMEM::

023572  012737  000001  002350          MOV     #1,NXMFLG       ;SET FLAG IF MEMORY ADDRESSED IS NON-EXISTENT.

023600                          ENDSRV
023600                                                                                  L10021:
023600  000002                                                                                  RTI
```

```
                                        .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
```

```

024002                          ENDTST
024002                                                                  L10023:
024002  104401                                                                  TRAP    C$ETST


024004                          BGNSRV  LOCATE                  ;INTERRUPT SERVICE ROUTINE
024004                                                                  LOCATE::
024004  010046                          MOV     R0,-(SP)        ;SAVE R0
024006  005737  002350                  TST     NXMFLG          ;HAVE WE HAD AT LEAST 1 PREVIOUS TRAP?
024012  001006                          BNE     10$             ;IF YES, DON'T BOTHER DECLARING ANOTHER
                                                                ;DEVICE FATAL ERROR
024014                                  ERRDF   6,EMTO          ;NON-EXISTENT DEVICE ERROR
024014  104455                                                                  TRAP    C$ERDF
024016  000006                                                                  .WORD   6
024020  024062                                                                  .WORD   EMTO
024022  000000                                                                  .WORD   0
024024  005237  002350                  INC     NXMFLG          ;SET THE FLAG
024030                          10$:
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
024056  012600                          MOV     (SP)+,R0        ;RESTORE R0
024060                          ENDSRV
024060                                                                  L10024:
024060  000002                                                                  RTI

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
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
                                        .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

   024320  022705  000005                CMP     #5,R5              ;ARE WE DONE?
   024324  001410                        BEQ     5$                 ;IF YES - EXIT
   024326  062704  000002                ADD     #2,R4              ;INCR. ROM NUMBERS
   024332  062705  000002                ADD     #2,R5              ;
   024336  062737  002000  002410        ADD     #2000,ROMADR       ;ADDRESS OF BYTES CONTAINING NEXT ROM REV #S.
   024344  000737                        BR      1$

   024346                        5$:
   024346                          ENDSUB
   024346                                                         L10026:
   024346  104403                                                             TRAP    C$ESUB


   024350                          BGNSUB
   024350                                                         T2.2:
   024350  104402                                                             TRAP    C$BSUB
   024352  005037  002342                CLR     FLAG               ;USE THE FLAG TO MARK WHEN AN ERRDF
                                                                    ;HAS BEEN DETECTED IN THIS TEST.
   024356  005004                        CLR     R4                 ;START CRC CHECK WITH ROM 0
                                                                    ;R4 IS THE ROM #.  THE LOCATION FOR THE
                                                                    ;ROM IS CONTAINED IN THE TABLE 'ROMLOC'.
   024360  005037  002410                CLR     ROMADR             ;BEGIN AT ROM ADDRESS 0

   024364                        10$:
   024364  012737  177777  002400        MOV     #-1,LOCRC          ;INITIALIZE CRC WORD FOR THE LOW BYTE
                                                                    ;CALCULATION.
   024372  012737  177777  002402        MOV     #-1,HICRC          ;INIT. CRC WORD FOR THE HIGH BYTE.
   024400  012701  001000                MOV     #1000,R1           ;COUNTER FOR LOOP TO READ THE ROM CONTENTS
                                                                    ;AND CALCULATE THE CRC - THE COUNTER IS 512.,
                                                                    ;BECAUSE 2 ADDRESS LOCATIONS ARE READ FOR EACH
                                                                    ;PASS (I.E. THE ROMS ARE 1K X 8 BITS)


                                         ;
                                         ; BECAUSE A ROM OUT WILL OUTPUT THE ROM CONTENTS (I.E. 16 BITS)
                                         ; THIS ROUTINE WILL CALCULATE/CHECK THE CRC 2 ROMS AT A TIME.
                                         ;
   024404                        20$:
   024404                                CALL    $ROMO              ;GET THE ROM CONTENTS
   024410  117737  155624  002404        MOVB    @BSEL6,LOWORD      ;SAVE THE LOW BYTE OF THE ROM CONTENTS.
   024416  117737  155626  002406        MOVB    @BSEL7,HIWORD      ;SAVE THE HIGH BYTE OF THE ROM CONTENTS.
   024424  005237  002410                INC     ROMADR             ;INCREMENT THE ROM ADDRESS POINTER
   024430                                CALL    $ROMO              ;GET THE CONTENTS OF THE NEXT ROM ADDRESS
   024434  117737  155600  002405        MOVB    @BSEL6,LOWORD+1    ;SAVE THE NEXT LOW BYTE.
   024442  117737  155602  002407        MOVB    @BSEL7,HIWORD+1    ;SAVE THE NEXT HIGH BYTE.
                                                                    ;NOTE: AT THIS POINT LOWORD IS A WORD WHICH
                                                                    ;HAS 2 CONSECUTIVE LOW BYTES OF ROM CONTENTS.
   024450  005237  002410                INC     ROMADR             ;INCREMENT THE ROM ADDRESS POINTER
   024454  005301                        DEC     R1                 ;ARE WE FINISHED WITH THESE 2 ROMS?
   024456  001443                        BEQ     40$                ;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$PNTB
    024654  062706  000012                                                                             ADD     #12,SP
    024660                          50$:
    024660  005204                           INC     R4                 ;INCR ROM #
    024662  005137  002402                   COM     HICRC              ;COMPLEMENT THE CALCULATED CRC FOR THE HI BYTE
    024666  023737  002402  002406           CMP     HICRC,HIWORD       ;ROM CRC AND CALCULATED CRC THE SAME?
    024674  001427                           BEQ     60$                ;IF YES - CHECK THE ROM LOCATIONS.
    024676  005737  002342                   TST     FLAG               ;HAS AN ERRDF ALREADY BEEN DECLARED (REMEMBER
                                                                        ;WE'RE IN A LOOP)
    024702  001007                           BNE     51$                ;IF YES, DON'T BOTHER WITH ANOTHER ERRDF.
    024704  012737  000001  002342           MOV     #1,FLAG            ;FLAG THAT ERRDF HAS BEEN DETECTED.
    024712                                   ERRDF   7,EMT1             ;ROM ERROR
    024712  104455                                                                                     TRAP    C$ERDF
    024714  000007                                                                                     .WORD   7
    024716  025434                                                                                     .WORD   EMT1
    024720  000000                                                                                     .WORD   0
    024722                          51$:
    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$PNTB
    024750  062706  000012                                                                             ADD     #12,SP
    024754                          60$:
    024754  022704  000005                   CMP     #5,R4              ;IF WE'VE DONE ROMS 0-5, WE'RE DONE.
    024760  001403                           BEQ     70$                ;EXIT WHEN DONE
    024762  005204                           INC     R4                 ;CHECK THE NEXT ROM.
    024764  000137  024364                   JMP     10$
    024770                          70$:

    024770                            ENDSUB
    024770                                                                                 L10027:
    024770  104403                                                                                     TRAP    C$ESUB

    024772                            BGNSUB
    024772                                                                                 T2.3:
    024772  104402                                                                                     TRAP    C$BSUB
    024774  005037  002342                   CLR     FLAG               ;CLEAR FLAG
    025000  005004                           CLR     R4                 ;BEGIN AT ROM 0
    025002  012737  001775  002410           MOV     #1775,ROMADR       ;ADDRESS OF BYTE CONTAINING ROM #
    025010                          10$:
    025010                                   CALL    $ROMO              ;GET ROM CONTENTS
    025014  117701  155220                   MOVB    @BSEL6,R1          ;SAVE THE CONTENTS OF THE LOW BYTE
                                                                        ;FOR ROMS 0,2,4
    025020  000402                           BR      17$
    025022                          15$:
    025022  117701  155222                   MOVB    @BSEL7,R1          ;SAVE THE CONTENTS OF THE HIGH BYTE
                                                                        ;FOR ROMS 1,3,5
    025026                          17$:
    025026  042701  177760                   BIC     #^C17,R1           ;CONVERT THE ASCII BYTE TO AN OCTAL WORD.
    025032  020104                           CMP     R1,R4              ;IS THIS THE EXPECTED ROM #
    025034  001427                           BEQ     20$                ;IF YES - OK.
    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$ERRDF
025706  000024                                                                                .WORD   20
025710  026336                                                                                .WORD   EMT4
025712  000000                                                                                .WORD   0
025714                          10$:
                                                               ;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-.
026744  132737  000001  002734          BITB    #BIT0,BASE+ISP13 ;CHECK EXT ENABLE BIT IN THE BASE TABLE.
                                                                ;IMAGE OF SCRATCH PAD 13.
026752  001005                          BNE     10$             ;BIT SET - OK.
026754                                  ERRDF   24,EMT7         ;ERROR EXT ENABLE CLEAR
026754  104455                                                                                  TRAP    C$ERDF
026756  000030                                                                                  .WORD   24
026760  027536                                                                                  .WORD   EMT7
026762  000000                                                                                  .WORD   0
026764  000430                          BR      20$
026766                          10$:
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
                                                                ;****                 ****

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
                                                                ;****                 ****

027012                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END
027012  104410                                                                                  TRAP    C$ESCAPE
027014  000212                                                                                  .WORD   L10036-.
027016                                  SHUTDN                  ;HALT THE DMR
                                                                ;**** MACRO EXPANSION ****
027016  004737  012550                  JSR     PC, $HALT       ;DMR HALT ROUTINE.
                                                                ;****                 ****
027022                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
027022  104410                                                                                  TRAP    C$ESCAPE
027024  000202                                                                                  .WORD   L10036-.
027026  132737  000001  002734          B!TB    #BIT0,BASE+ISP13 ;CHECK EXT ENABLE BIT IN THE BASE TABLE.
                                                                ;IMAGE OF SCRATCH PAD 13.
027034  001404                          BEQ     20$             ;IF CLEAR OK
027036                                  ERRDF   24,EMT7         ;ERROR EXT ENABLE SET
027036  104455                                                                                  TRAP    C$ERDF
027040  000030                                                                                  .WORD   24
027042  027536                                                                                  .WORD   EMT7
027044  000000                                                                                  .WORD   0
027046                          20$:
027046                            ENDSUB
027046                                                                                  L10037:
027046  104403                                                                                  TRAP    C$ESUB

027050                            BGNSUB
027050                                                                                  T5.2:
027050  104402                                                                                  TRAP    C$BSUB
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.
```

```
027174  122737  000013  002720          CMPB    #13,BASE+TH2L    ;CHECK NAK SENT THRESH. IN BASE TABLE.
027202  001004                          BNE     10$              ;IF NOT 13, BR TO ERROR
027204  122737  000004  002724          CMPB    #4,BASE+TH4L     ;CHECK NO BUF. THRESH. IN BASE TABLE.
027212  001404                          BEQ     20$              ;IF 4, ALL CHECKS OK - EXIT
027214                          10$:
027214                                  ERRDF   24,EMT8,ERRT3
027214  104455                                                                                 TRAP    C$ERDF
027216  000030                                                                                 .WORD   24
027220  027567                                                                                 .WORD   EMT8
027222  027230                                                                                 .WORD   ERRT3
027224                          20$:
027224                            ENDSUB
027224                                                                               L10040:
027224  104403                                                                                 TRAP    C$ESUB
027226                          ENDTST
027226                                                                               L10036:
027226  104401                                                                                 TRAP    C$ETST

027230                          BGNMSG  ERRT3
027230                                                                               ERRT3::
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$PNTB
027254  062706  000010                                                                         ADD     #10,SP
027260                                  PRINTB  #FMT11,<B,BASE+ISP13> ;PRINT OUT THE IMAGE OF SCRATCH PAD 13.
027260  005046                                                                                 CLR     -(SP)
027262  153716  002734                                                                         BISB    BASE+ISP13,(SP)
027266  012746  027624                                                                         MOV     #FMT11,-(SP)
027272  012746  000002                                                                         MOV     #2,-(SP)
027276  010600                                                                                 MOV     SP,R0
027300  104414                                                                                 TRAP    C$PNTB
027302  062706  000006                                                                         ADD     #6,SP
027306  122737  000054  002713          CMPB    #54,BASE+PRETIM ;IS REP/SEL TIME OK?
027314  001413                          BEQ     1$               ;BR IF OK
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$PNTB
027340  062706  000006                                                                         ADD     #6,SP
027344                          1$:
027344  122737  000003  002716          CMPB    #3,BASE+TH1L     ;IS NAK RCVD OK?
027352  001413                          BEQ     2$               ;BR IF OK.
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 BIT 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 EXPANSION ****
   030270  004737  010274                  JSR     PC, $WAIT       ;CALL WAIT ROUTINE
```

```
030274  000000                                  .WORD   0         ;FLAG THAT WE'RE WAITING FOR RDI
                                                                  ;****                    ****
030276  032777  000020  151732          BIT     #BIT4,@SEL4       ;IS THE HDX BIT SET IN MODEM STATUS REG?
030304  001004                          BNE     10$               ;OK - IF BIT SET
030306                                  ERRDF   21,EMT11                    ;ERROR HDX BIT CLEAR.
030306  104455                                                                                      TRAP    C$ERDF
030310  000025                                                                                      .WORD   21
030312  030574                                                                                      .WORD   EMT11
030314  000000                                                                                      .WORD   0
030316                          10$:
030316                                  SHUTDN                    ;HALT THE DMR.
                                                                  ;**** MACRO EXPANSION ****
030316  004737  012550                  JSR     PC, $HALT         ;DMR HALT ROUTINE.
                                                                  ;****                    ****

030322                          ENDSUB
030322                                                                                      L10044:
030322  104403                                                                                      TRAP    C$ESUB

030324                          BGNSUB
030324                                                                                      T6.3:
030324  104402                                                                                      TRAP    C$BSUB
030326                                  CLEAR                     ;MACRO FOR MASTER CLEAR
                                                                  ;**** MACRO EXPANSION ****
030326  004737  011066                  JSR     PC, $MSCLR        ;ISSUE A DMR MASTER CLEAR
                                                                  ;****                    ****

030332                                  ESCAPE  TST               ;IF ERROR, BR TO TEST END.
030332  104410                                                                                      TRAP    C$ESCAPE
030334  000160                                                                                      .WORD   L10042-.
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
                                                                  ;****                    ****

030350                                  ESCAPE  TST               ;IF ERROR, BR TO TEST END.
030350  104410                                                                                      TRAP    C$ESCAPE
030352  000142                                                                                      .WORD   L10042-.
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)
                                                                  ;****                    ****

030362                                  ESCAPE  TST               ;IF ERROR, BR TO TEST END.
030362  104410                                                                                      TRAP    C$ESCAPE
030364  000130                                                                                      .WORD   L10042-.
030366                                  SHUTDN                    ;HALT
                                                                  ;**** MACRO EXPANSION ****
030366  004737  012550                  JSR     PC, $HALT         ;DMR HALT ROUTINE.
                                                                  ;****                    ****
030372                                  ESCAPE  TST               ;IF ERROR, BR TO TEST END.
030372  104410                                                                                      TRAP    C$ESCAPE
030374  000120                                                                                      .WORD   L10042-.
```

```
030376  132737  000002  002730           BITB    #BIT1,BASE+ISP7 ;IS THE MAINTENANCE BIT SET IN IMAGE OF SP 7.
030404  001004                           BNE     10$
030406                                   ERRDF   21,EMT12        ;ERROR - MAINT. BIT NOT SET.
030406  104455                                                                                   TRAP    C$ERDF
030410  000025                                                                                   .WORD   21
030412  030630                                                                                   .WORD   EMT12
030414  000000                                                                                   .WORD   0
030416                           10$:
030416                             ENDSUB
030416                                                                                   L10045:
030416  104403                                                                                   TRAP    C$ESUB

030420                             BGNSUB
030420                                                                                   T6.4:
030420  104402                                                                                   TRAP    C$BSUB

030422                                   CLEAR                           ;MACRO FOR MASTER CLEAR
                                                                         ;**** MACRO EXPANSION ****
030422  004737  011066                   JSR     PC, $MSCLR              ;ISSUE A DMR MASTER CLEAR
                                                                         ;****                ****

030426                                   ESCAPE  TST                     ;IF ERROR, BR TO TEST END.
030426  104410                                                                                   TRAP    C$ESCAPE
030430  000064                                                                                   .WORD   L10042-.
030432  005737  002254                   TST     DMTURN                  ;IS INTERNAL LOOPBACK REQUESTED?
030436  001004                           BNE     1$                      ;IF NOT, BR
030440  052737  004000  030462           BIS     #LPLU,100$              ;SET LINE UNIT LOOPBACK.
030446  000403                           BR      2$
030450                           1$:
030450  042737  004000  030462           BIC     #LPLU,100$              ;CLEAR LINE UNIT LOOPBACK.
030456                           2$:
030456                                   CALL    $BASEI                  ;BASE IN COMMAND.
030462  000000                   100$:           .WORD   0               ;MAINTENANCE BITS (L. U. LOOPBACK?)
030464  002636                                   .WORD   BASE            ;BASE TABLE ADDRESS.
030466  000522                                   .WORD   DMR             ;DMR MODE.
030470                                   ESCAPE  TST                     ;IF ERROR, BR TO TEST END.
030470  104410                                                                                   TRAP    C$ESCAPE
030472  000022                                                                                   .WORD   L10042-.
030474                                   CALL    $LOOP                   ;EXTENDED DMR COMMAND TO SET MAINT. BITS
                                                                         ;IF NEEDED. THIS WILL ALLOW MODEM LOOPBACK
                                                                         ;IF THE USER REQUESTED IT.
030500                                   ESCAPE  TST                     ;IF ERROR, BR TO TEST END.
030500  104410                                                                                   TRAP    C$ESCAPE
030502  000012                                                                                   .WORD   L10042-.
030504                                   CNTRIN                          ;MACRO FOR CONTROL IN (FULL DUPLEX)
                                                                         ;**** MACRO EXPANSION ****
030504  004737  011520                   JSR     PC, $CNTIN              ;CALL CONTROL IN ROUTINE WITH DEFAULT
030510  000000                                   .WORD   0               ;SEL6 - FULL DUPLEX, RUN MODE, 1 SEC START.
                                                                         ;****                ****
030512                             ENDSUB
030512                                                                                   L10046:
030512  104403                                                                                   TRAP    C$ESUB



030514                           ENDTST
030514                                                                                   L10042:
```

```
030514  104401                                                              TRAP    C$ETST

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
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
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
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
                                          .EVEN
```

```
                                .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
```

```
                                                                   ;****                   ****
   030756                                  ESCAPE  TST             ;IF ERROR, EXIT TEST.
   030756  104410                                                                                   TRAP    C$ESCAPE
   030760  000142                                                                                   .WORD   L10047-.
   030762                          20$:
   030762  127737  151252  030734          CMPB    @BSEL6,15$      ;DID THE MICROCODE COPY THE BITS?
   030770  001406                          BEQ     25$             ;IF YES CONTINUE
   030772  013703  030734                  MOV     15$,R3          ;SAVE THE PATTERN FOR THE ERROR MESSAGE.
   030776                                  ERRDF   22,EMT13,ERRT2  ;WRITE MODEM ERROR
   030776  104455                                                                                   TRAP    C$ERDF
   031000  000026                                                                                   .WORD   22
   031002  031170                                                                                   .WORD   EMT13
   031004  031136                                                                                   .WORD   ERRT2
   031006                          25$:
   031006                                  WAIT    RQI             ;CLEAR RQI AND WAIT FOR RDI TO CLEAR.
                                                                   ;**** MACRO EXPANSION ****
   031006  004737  010704                  JSR     PC, $CLRQI      ;CLEAR RQI AND WAIT FOR IT TO BE CLEARED.
                                                                   ;****                   ****
   031012                                  ESCAPE  TST             ;IF ERROR, EXIT TEST.
   031012  104410                                                                                   TRAP    C$ESCAPE
   031014  000106                                                                                   .WORD   L10047-.
   031016  005301                          DEC     R1              ;DECREMENT COUNTER
   031020  001337                          BNE     10$             ;CONTINUE UNTIL ALL 5 PATTERNS TRIED.
   031022                          30$:

   031022                             ENDSUB
   031022                                                                                   L10050:
   031022  104403                                                                                   TRAP    C$ESUB

   031024                             BGNSUB
   031024                                                                                   T7.2:
   031024  104402                                                                                   TRAP    C$BSUB

   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)
                                                                   ;****                   ****

   031040                                  ESCAPE  TST             ;IF ERROR, BR TO END.
   031040  104410                                                                                   TRAP    C$ESCAPE
   031042  000060                                                                                   .WORD   L10047-.
   031044  052777  000057  151160          BIS     #RQI!RMODEM,@SEL0 ;SET RQI AND READ MODEM COMMAND.
   031052                                  WAIT    RDI             ;WAIT FOR RDI TO BE SET
                                                                   ;**** MACRO EXPANSION ****
   031052  004737  010274                  JSR     PC, $WAIT       ;CALL WAIT ROUTINE
   031056  000000                                  .WORD   0       ;FLAG THAT WE'RE WAITING FOR RDI
                                                                   ;****                   ****
   031060                                  ESCAPE  TST             ;IF ERROR, EXIT TEST.
   031060  104410                                                                                   TRAP    C$ESCAPE
   031062  000040                                                                                   .WORD   L10047-.

   031064  122777  000020  151146          CMPB    #20,@BSEL6      ;IS ONLY HDX SET?
   031072  001406                          BEQ     10$             ;IF YES - OK
   031074  012703  000021                  MOV     #21,R3          ;SAVE THE PATTERN FOR THE ERROR MESSAGE.
   031100                                    ERRDF   22,EMT13,ERRT2
   031100  104455                                                                         TRAP     C$ERDF
   031102  000026                                                                         .WORD    22
   031104  031170                                                                         .WORD    EMT13
   031106  031136                                                                         .WORD    ERRT2
   031110                           10$:
   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.
                                                                     ;****                ****
   031114                                    SHUTDN
                                                                     ;**** MACRO EXPANSION ****
   031114  004737  012550                    JSR     PC, $HALT       ;DMR HALT ROUTINE.
                                                                     ;****                ****

   031120                                ENDSUB
   031120                                                                         L10051:
   031120  104403                                                                         TRAP     C$ESUB

   031122                           ENDTST
   031122                                                                         L10047:
   031122  104401                                                                         TRAP     C$ETST

   031124  000000  000376  000001   MODEM:   .WORD   0,376,1,252,357 ;PATTERN TO WRITE INTO MODEM
   031132  000252  000357

   031136                           BGNMSG   ERRT2
   031136                                                                         ERRT2::
   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$PNTB
   031162  062706  000010                                                                 ADD      #10,SP
   031166                           ENDMSG
   031166                                                                         L10052:
   031166  104423                                                                         TRAP     C$MSG


   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
                                             .EVEN

   031214     045     101     127   FMT19:   .ASCIZ  /%AWROTE IN BSEL6: %03%A  MODEM FORMAT IN BSEL6: %03%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)
                                                                      ;****                        ****

   031356                                   ESCAPE  TST               ;IF ERROR, BR TO TEST END.
   031356  104410                                                                                      TRAP    C$ESCAPE
   031360  000350                                                                                      .WORD   L10053-.
   031362  012700  000003                   MOV     #3,R0             ;SET UP A COUNTER
   031366                           1$:
   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
                                                                      ;****                        ****

   031400                                   WAIT    RDO               ;WAIT FOR RDO TO BE SET
                                                                      ;**** MACRO EXPANSION ****
   031400  004737  010274                   JSR     PC, $WAIT         ;CALL WAIT ROUTINE
   031404  000001                                   .WORD   1         ;FLAG THAT WE'RE WAITING FOR RDO
                                                                      ;****                        ****
   031406                                   ESCAPE  TST               ;IF RDO NOT SET, BR TO TEST END.
   031406  104410                                                                                      TRAP    C$ESCAPE
   031410  000320                                                                                      .WORD   L10053-.
   031412  005300                           DEC     R0                ;DEC COUNTER
   031414  001404                           BEQ     10$               ;TRANSMIT FOR 3 TIMES.
   031416  042777  000207  150610           BIC     #RDO!CMD,@SEL2    ;CLEAR BACC OUT TRANSMIT.
   031424  000760                           BR      1$                ;TRANSMIT AGAIN
   031426                           10$:
   031426  032777  000001  150600           BIT     #CNTRL,@SEL2      ;IS THIS A CONTROL OUT?
   031434  001005                           BNE     20$               ;IF YES, PROCEED.
   031436                                   ERRDF   8,EMG8,ERRG2      ;EXPECTED CONTROL OUT NOT RECEIVED.
   031436  104455                                                                                      TRAP    C$ERDF
   031440  000010                                                                                      .WORD   8
   031442  017762                                                                                      .WORD   EMG8
   031444  015112                                                                                      .WORD   ERRG2
   031446  000410                           BR      30$               ;EXIT
   031450                           20$:
   031450  032777  000004  150562           BIT     #NOBFR,@SEL6      ;IS THE NO BUFFER FLAG SET?
   031456  001004                           BNE     30$               ;IF YES - OK, PROCEED.
   031460                                   ERRDF   9,EMG9,ERRG2      ;WE'RE NOT GETTING EXPECTED RESULT
   031460  104455                                                                                      TRAP    C$ERDF
   031462  000011                                                                                      .WORD   9
   031464  020026                                                                                      .WORD   EMG9
   031466  015112                                                                                      .WORD   ERRG2
                                                                      ;(EITHER CONTROL OUT OR NOBUF/NAKS)
   031470                           30$:
   031470  042777  000207  150536           BIC     #RDO!CMD,@SEL2    ;CLEAR CONTROL OUT
   031476                                   WAIT    RDO               ;EXPECT ANOTHER BACC OUT.
                                                                      ;**** MACRO EXPANSION ****
   031476  004737  010274                   JSR     PC, $WAIT         ;CALL WAIT ROUTINE
   031502  000001                                   .WORD   1         ;FLAG THAT WE'RE WAITING FOR RDO
                                                                      ;****                        ****
   031504                                   ESCAPE  TST               ;IF ERROR, BR TO END.
   031504  104410                                                                                      TRAP    C$ESCAPE
   031506  000222                                                                                      .WORD   L10053-.
   031510  042777  000207  150516           BIC     #RDO!CMD,@SEL2    ;CLEAR BACC OUT.
```

```
031516                                  SHUTDN                  ;HALT DMR
                                                                ;**** MACRO EXPANSION ****
031516  004737  012550                  JSR     PC, $HALT       ;DMR HALT ROUTINE.
                                                                ;****                 ****
031522                          50$:
031522                            ENDSUB
031522                                                                                 L10054:
031522  104403                                                                                 TRAP    C$ESUB

031524                            BGNSUB
031524                                                                                 T8.2:
031524  104402                                                                                 TRAP    C$BSUB
031526                                  CLEAR                   ;MACRO FOR MASTER CLEAR
                                                                ;**** MACRO EXPANSION ****
031526  004737  011066                  JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                                ;****                 ****

031532                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
031532  104410                                                                                 TRAP    C$ESCAPE
031534  000174                                                                                 .WORD   L10053-.
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
                                                                ;****                 ****

031550                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
031550  104410                                                                                 TRAP    C$ESCAPE
031552  000156                                                                                 .WORD   L10053-.
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.
                                                                ;****                 ****

031562                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
031562  104410                                                                                 TRAP    C$ESCAPE
031564  000144                                                                                 .WORD   L10053-.

                                                                ;SET THRESHOLDS:
                                                                ;NAKS RCVD = 3
                                                                ;NAKS SENT = 3
                                                                ;REP SENT = 377
                                                                ;NO BUFFER = 7
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)
                                                                ;****                 ****

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,ERRG2          ;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
```

```

031732                          BGNMSG  ERRT4
031732                                                                          ERRT4::
031732                                  PRINTB  #FMG7,<B,BASE+3>,<B,BASE+6>
031732  005046                                                                          CLR     -(SP)
031734  153716  002644                                                                  BISB    BASE+6,(SP)
031740  005046                                                                          CLR     -(SP)
031742  153716  002641                                                                  BISB    BASE+3,(SP)
031746  012746  016510                                                                  MOV     #FMG7,-(SP)
031752  012746  000003                                                                  MOV     #3,-(SP)
031756  010600                                                                          MOV     SP,R0
031760  104414                                                                          TRAP    C$PNTB
031762  062706  000010                                                                  ADD     #10,SP
031766                          ENDMSG
031766                                                                          L10056:
031766  104423                                                                          TRAP    C$MSG

031770     116     101     113  EMT20:  .ASCIZ  /NAKS ERROR/
031773     123     040     105
031776     122     122     117
032001     122     000
                                        .EVEN

```

```
     1                                  .SBTTL          TEST 9 - NON-EXISTENT MEMORY ERROR
     2
     3                                  ;**********************************************************************
     4                                  ;*              TEST 9 - DMR-11
     5                                  ;* NON-EXISTENT MEMORY (NXM) ERROR CHECK
     6                                  ;* PERFORM DMR COMMANDS USING NXM ADDRESSES; VERIFY THAT NXM ERROR IS
     7                                  ;* REPORTED IN EACH OF THE FOLLOWING SUBTESTS:
     8                                  ;*  SUBTEST 1  -  BASE IN RESUME COMMAND - BASE TABLE ADDRESS IS NXM
     9                                  ;*  SUBTEST 2  -  BA/CC IN RECEIVE COMMAND - BA/CC IN ADDRESS IS NXM
    10                                  ;*  SUBTEST 3  -  BA/CC IN TRANSMIT COMMAND - BA/CC IN ADDRESS IS NXM
    11                                  ;*
    12                                  ;**********************************************************************
    13 032004                           BGNTST
       032004                                                                          T9::
    14 032004                             BGNSUB
       032004                                                                          T9.1:
       032004  104402                                                                              TRAP    C$BSUB
    15 032006                                   CLEAR                      ;MASTER CLEAR MACRO
                                                                           ;**** MACRO EXPANSION ****
       032006  004737  011066                   JSR     PC, $MSCLR         ;ISSUE A DMR MASTER CLEAR
                                                                           ;****                 ****
    16
    17 032012                                   ESCAPE  TST                ;IF ERROR, BR TO TEST END
       032012  104410                                                                              TRAP    C$ESCAPE
       032014  000500                                                                              .WORD   L10057-.
    18 032016                                   BASEIN                     ;BASE IN COMMAND - DMR MODE
                                                                           ;**** MACRO EXPANSION ****
       032016  004737  011264                   JSR     PC, $BASEI         ;CALL BASE IN ROUTINE WITH DEFAULTS
       032022  004000                                   .WORD   LPLU       ;SET LINE UNIT LOOP
       032024  002636                                   .WORD   BASE       ;BASE TABLE ADDRESS
       032026  000522                                   .WORD   DMR        ;DMR-11 MODE
                                                                           ;****                 ****
    19
    20 032030                                   ESCAPE  TST                ;IF ERROR, BR TO TEST END
       032030  104410                                                                              TRAP    C$ESCAPE
       032032  000462                                                                              .WORD   L10057-.
    21 032034                                   SHUTDN                     ;HALT
                                                                           ;**** MACRO EXPANSION ****
       032034  004737  012550                   JSR     PC, $HALT          ;DMR HALT ROUTINE.
                                                                           ;****                 ****
    22 032040                                   ESCAPE  TST                ;IF ERROR, BR TO TEST END.
       032040  104410                                                                              TRAP    C$ESCAPE
       032042  000452                                                                              .WORD   L10057-.
    23 032044  012737  000001  002364           MOV     #CNTRL,ERROR       ;THIS FLAG WILL INHIBIT CONTROL OUT
    24                                                                     ;ERROR REPORTING - BECAUSE WE EXPECT ONE.
    25
    26                                                                     ;BASE IN RESUME COMMAND WITH NXM BASE TABLE.
    27 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
                                                                           ;****                 ****
    28
    29 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-.
```

```
032212  012737  000001  002364          MOV     #CNTRL,ERROR      ;INHIBIT CONTROL OUT ERROR REPORTING AGAIN.

                                                                  ;BA/CC IN REC. COMMAND WITH NXM
                                                                  ;ADDR = 760000 AND A CHARACTER COUNT = 3.
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
                                                                  ;****                  ****

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
                                                                  ;****                  ****

032244                                  WAIT    RDO               ;WAIT FOR RDO
                                                                  ;**** MACRO EXPANSION ****
032244  004737  010274                  JSR     PC, $WAIT         ;CALL WAIT ROUTINE
032250  000001                                  .WORD   1         ;FLAG THAT WE'RE WAITING FOR RDO
                                                                  ;****                  ****
032252  032777  000001  147754          BIT     #CNTRL,@SEL2      ;IS THERE A CONTROL OUT REPORTED ?
032260  001005                          BNE     10$               ;IF YES, PROCEED.
032262                                  ERRDF   8,EMG8,ERRG2      ;EXPECTED CONTROL OUT
032262  104455                                                                             TRAP    C$ERDF
032264  000010                                                                             .WORD   8
032266  017762                                                                             .WORD   EMG8
032270  015112                                                                             .WORD   ERRG2
032272  000410                          BR      20$               ;EXIT
032274                          10$:
032274  032777  000400  147736          BIT     #NXM,@SEL6        ;IS THE NXM FLAG SET?
032302  001004                          BNE     20$               ;IF YES - ERROR REPORTED CORRECTLY
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

032314                          20$:
032314  042777  000207  147712          BIC     #RDO!CMD,@SEL2    ;CLEAR RDO AND THE COMMAND BITS.
032322  005037  002364                  CLR     ERROR             ;ENABLE ERROR REPORTING
032326                              ENDSUB
032326                                                                             L10061:
032326  104403                                                                             TRAP    C$ESUB

032330                              BGNSUB
032330                                                                             T9.3:
032330  104402                                                                             TRAP    C$BSUB
032332                                  CLEAR                     ;MACRO FOR MASTER CLEAR
                                                                  ;**** MACRO EXPANSION ****
032332  004737  011066                  JSR     PC, $MSCLR        ;ISSUE A DMR MASTER CLEAR
                                                                  ;****                  ****

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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
032456  000410                          BR      20$             ;EXIT
032460                          10$:
032460  032777  000400  147552          BIT     #NXM,@SEL6      ;IS THE NXM FLAG SET?
032466  001004                          BNE     20$             ;IF YES - ERROR REPORTED CORRECTLY
032470                                  ERRDF   9,EMG9,ERRG2    ;UNEXPECTED CONTROL OUT RECEIVED
032470  104455                                                                        TRAP     C$ERDF
032472  000011                                                                        .WORD    9
032474  020026                                                                        .WORD    EMG9
032476  015112                                                                        .WORD    ERRG2
032500                          20$:
032500  042777  000207  147526          BIC     #RDO!CMD,@SEL2  ;CLEAR RDO AND THE COMMAND BITS.
032506  005037  002364                  CLR     ERROR           ;DON'T INHIBIT CONTROL OUT ERRORS
032512                            ENDSUB
032512                                                                        L10062:
032512  104403                                                                        TRAP     C$ESUB

032514                          ENDTST
032514                                                                        L10057:
032514  104401                                                                        TRAP     C$ETST
```

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

    032602                                ESCAPE  TST              ;IF ERROR, BR TO TEST END.
    032602 104410                                                                                      TRAP     C$ESCAPE
    032604 000134                                                                                      .WORD    L10063-.

                                                                   ;BLIND THE RECEIVER BY GOING INTO HDX.
    032606                                DMRIN   WMODEM,0,BIT4    ;USE WRITE MODEM 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)
                                                                   ;****                ****

    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
                                                                   ;****                ****

    032632                                ESCAPE  TST              ;IF ERROR, EXIT
    032632 104410                                                                                      TRAP     C$ESCAPE
    032634 000104                                                                                      .WORD    L10063-.
    032636                                WAIT    RDO              ;WAIT FOR THE READY OUT.
                                                                   ;**** MACRO EXPANSION ****
    032636 004737 010274                  JSR     PC, $WAIT        ;CALL WAIT ROUTINE
    032642 000001                                 .WORD   1        ;FLAG THAT WE'RE WAITING FOR RDO
                                                                   ;****                ****
    032644                                ESCAPE  TST              ;IF ERROR, EXIT.
    032644 104410                                                                                      TRAP     C$ESCAPE
    032646 000072                                                                                      .WORD    L10063-.
    032650 023727 002414 011610           CMP     COUNT,#5000.     ;CHECK THE SOFTWARE TIMER COUNT.
                                                                   ;THE TIMER VALUE WAS DETERMINED
                                                                   ;EMPIRICALLY ON A 11/04, 11/34, 11/40, 11/70.
    032656 003005                         BGT     5$               ;IF OK - PROCEED
                                                                   ;****************************************
    032660                                ERRDF   19,EMG19         ;
    032660 104455                                                                                      TRAP     C$ERDF
    032662 000023                                                                                      .WORD    19
    032664 020370                                                                                      .WORD    EMG19
    032666 000000                                                                                      .WORD    0
                                                                   ;1MSEC PROGRAM TIMER - OUT OF RANGE.
                                                                   ;IF THIS ERROR OCCURS, CHECK THE M8207
                                                                   ;MICROPROCESSOR AS FOLLOWS:
                                                                   ;RESET THE DMR, SCOPE E-69, PIN 4 TO VERIFY
                                                                   ;THAT THE 1MSEC TIMER IS OUT OF RANGE.
                                                                   ;****************************************
    032670 000423                         BR      25$
    032672                          5$:
    032672 032777 000001 147334           BIT     #CNTRL,@SEL2     ;IS THIS A CONTROL OUT
    032700 001005                         BNE     10$              ;IF YES, PROCEED.
    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 AND 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, $BACC       ;CALL BA/CC IN ROUTINE WITH DEFAULTS
    033026  000040                                        .WORD   RQI!BACCT       ;BA/CC IN TRANSMIT COMMAND
    033030  002520                                        .WORD   TBUF    ;TRANSMIT BUFFER ADDRESS
    033032  000044                                        .WORD   TCOUNT  ;TRANSMIT CHARACTER COUNT
                                                                          ;****               ****
    033034                                10$:
```

```
033034                                     WAIT    RDO             ;WAIT FOR RDO TO BE SET
                                                                   ;**** MACRO EXPANSION ****
033034  004737  010274                     JSR     PC, $WAIT       ;CALL WAIT ROUTINE
033040  000001                                     .WORD   1       ;FLAG THAT WE'RE WAITING FOR RDO
                                                                   ;****                   ****
033042                                     ESCAPE  TST             ;IF RDO NOT SET, BR TO TEST END.
033042  104410                                                                                        TRAP    C$ESCAPE
033044  000054                                                                                        .WORD   L10064-.
033046  032777  000001  147160             BIT     #CNTRL,@SEL2    ;IS THIS A CONTROL OUT?
033054  001005                             BNE     20$             ;IF YES, PROCEED
033056                                     ERRDF   8,EMG8,ERRG2    ;EXPECTED CONTROL OUT.
033056  104455                                                                                        TRAP    C$ERDF
033060  000010                                                                                        .WORD   8
033062  017762                                                                                        .WORD   EMG8
033064  015112                                                                                        .WORD   ERRG2
033066  000410                             BR      40$             ;EXIT
033070                             20$:
033070  032777  000020  147142             BIT     #TOLONG,@SEL6   ;IS THE TOO LONG BIT SET?
033076  001004                             BNE     40$             ;IF YES, TEST OK - FINISH UP.
033100                             30$:
033100                                     ERRDF   9,EMG9,ERRG2    ;WE'RE NOT GETTING EXPECTED RESULT
033100  104455                                                                                        TRAP    C$ERDF
033102  000011                                                                                        .WORD   9
033104  020026                                                                                        .WORD   EMG9
033106  015112                                                                                        .WORD   ERRG2

033110                             40$:
033110  005037  002364                     CLR     ERROR           ;RESTORE ERROR FLAG TO NORMAL STATE.
033114                                     SHUTDN                  ;HALT THE DMR.
                                                                   ;**** MACRO EXPANSION ****
033114  004737  012550                     JSR     PC, $HALT       ;DMR HALT ROUTINE.
                                                                   ;****                   ****



033120                             ENDTST
033120                                                                                 L10064:
033120  104401                                                                                        TRAP    C$ETST


```

```
                                    .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
033214  000410                          BR      15$              ;EXIT
033216                          10$:
033216  032777  001000  147014          BIT     #HALTC,@SEL6     ;IS THE HALT - PROCEDURE ERROR BIT SET?
033224  001004                          BNE     15$              ;IF YES - ERROR REPORTED CORRECTLY
033226                                  ERRDF   9,EMG9,ERRG2     ;UNEXPECTED CONTROL OUT RECEIVED
033226  104455                                                                                 TRAP    C$ERDF
033230  000011                                                                                 .WORD   9
033232  020026                                                                                 .WORD   EMG9
033234  015112                                                                                 .WORD   ERRG2
033236                          15$:
033236  042777  000207  146770          BIC     #RDO!CMD,@SEL2   ;CLEAR RDO AND THE COMMAND BITS
033244  005037  002364                  CLR     ERROR            ;RESTORE FLAG
033250                            ENDSUB
033250                                                                                 L10066:
033250  104403                                                                                 TRAP    C$ESUB

033252                            BGNSUB
033252                                                                                 T12.2:
033252  104402                                                                                 TRAP    C$BSUB

033254                                  CLEAR                    ;MASTER CLEAR MACRO
                                                                 ;**** MACRO EXPANSION ****
033254  004737  011066                  JSR     PC, $MSCLR       ;ISSUE A DMR MASTER CLEAR
                                                                 ;****                ****

033260  012737  000001  002364          MOV     #CNTRL,ERROR     ;THIS FLAG WILL DISABLE ANY CONTROL OUT ERROR
                                                                 ;REPORTING BECAUSE WE ARE INTENTIONALLY
                                                                 ;CAUSING ONE IN THIS TEST.
033266  005037  002260                  CLR     DMRFLG           ;CLEAR FLAG THAT IS SET IN BASEIN IN ORDER
                                                                 ;TO FLAG THAT A CONTROL OUT-DMR RUN MODE
                                                                 ;COMMAND IS EXPECTED (THIS FLAG WAS SET IN
                                                                 ;THE PREVIOUS SUBTEST BASEIN)
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.
                                                                 ;****                ****

033300                                  WAIT    RDO              ;WAIT FOR RDO TO BE SET
                                                                 ;**** MACRO EXPANSION ****
033300  004737  010274                  JSR     PC, $WAIT        ;CALL WAIT ROUTINE
033304  000001                                  .WORD   1        ;FLAG THAT WE'RE WAITING FOR RDO
                                                                 ;****                ****
033306                                  ESCAPE  TST              ;IF RDO NOT SET, BR TO TEST END.
033306  104410                                                                                 TRAP    C$ESCAPE
033310  000514                                                                                 .WORD   L10065-.
033312  032777  000001  146714          BIT     #CNTRL,@SEL2     ;IS THIS A CONTROL OUT?
033320  001005                          BNE     10$              ;IF YES - PROCEED.
033322                                  ERRDF   8,EMG8,ERRG2     ;EXPECTED CONTROL OUT
033322  104455                                                                                 TRAP    C$ERDF
033324  000010                                                                                 .WORD   8
033326  017762                                                                                 .WORD   EMG8
033330  015112                                                                                 .WORD   ERRG2
033332  000410                          BR      15$              ;EXIT
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     #RDO!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
                                                                      ;****                ****
```

```
    033602                                  ESCAPE  TST               ;IF RDO NOT SET, BR TO TEST END.
    033602  104410                                                                              TRAP    C$ESCAPE
    033604  000220                                                                              .WORD   L10065-.
    033606  032777  000001  146420          BIT     #CNTRL,@SEL2      ;IS THIS A CONTROL OUT?
    033614  001005                          BNE     10$               ;IF YES - PROCEED.
    033616                                  ERRDF   8,EMG8,ERRG2      ;EXPECTED CONTROL OUT
    033616  104455                                                                              TRAP    C$ERDF
    033620  000010                                                                              .WORD   8
    033622  017762                                                                              .WORD   EMG8
    033624  015112                                                                              .WORD   ERRG2
    033626  000410                          BR      15$               ;EXIT
    033630                          10$:
    033630  032777  001000  146402          BIT     #HALTC,@SEL6      ;IS THE HALT - PROCEDURE ERROR BIT SET?
    033636  001004                          BNE     15$               ;IF YES - ERROR REPORTED CORRECTLY
    033640                                  ERRDF   9,EMG9,ERRG2      ;UNEXPECTED CONTROL OUT RECEIVED
    033640  104455                                                                              TRAP    C$ERDF
    033642  000011                                                                              .WORD   9
    033644  020026                                                                              .WORD   EMG9
    033646  015112                                                                              .WORD   ERRG2
    033650                          15$:
    033650  042777  000207  146356          BIC     #RDO!CMD,@SEL2    ;CLEAR RDO AND THE COMMAND BITS.
    033656  005037  002364                  CLR     ERROR             ;RESTORE FLAG
    033662                              ENDSUB
    033662                                                                              L10071:
    033662  104403                                                                              TRAP    C$ESUB

    033664                              BGNSUB
    033664                                                                              T12.5:
    033664  104402                                                                              TRAP    C$BSUB
    033666                                  CLEAR                     ;MASTER CLEAR
                                                                      ;**** MACRO EXPANSION ****
    033666  004737  011066                  JSR     PC, $MSCLR        ;ISSUE A DMR MASTER CLEAR
                                                                      ;****                  ****

    033672                                  ESCAPE  TST               ;IF ERROR, EXIT.
    033672  104410                                                                              TRAP    C$ESCAPE
    033674  000130                                                                              .WORD   L10065-.
    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
                                                                      ;****                  ****

    033710                                  ESCAPE  TST               ;IF ERROR, EXIT.
    033710  104410                                                                              TRAP    C$ESCAPE
    033712  000112                                                                              .WORD   L10065-.
    033714  012737  000001  002364          MOV     #CNTRL,ERROR      ;THIS FLAG WILL DISABLE ANY CONTROL OUT
                                                                      ;ERROR REPORTING BECAUSE WE ARE INTENTIONALLY
                                                                      ;CAUSING ONE.
    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   PCI!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
```

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

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

    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      ;ISSUE 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-.

   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
                                                                          ;****                   ****

   034166                                      ESCAPE  TST                ;IF ERROR (I.E. RDI NOT SET), ESCAPE
   034166  104410                                                                            TRAP    C$ESCAPE
   034170  000364                                                                            .WORD   L10073-.

   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
                                                                          ;****                   ****

   034204                                      ESCAPE  TST                ;IF ERROR (I.E. RDI NOT SET), ESCAPE
   034204  104410                                                                            TRAP    C$ESCAPE
   034206  000346                                                                            .WORD   L10073-.

   034210                             20$:
   034210                                      WAIT    RDO                ;WAIT FOR RDO
                                                                          ;**** MACRO EXPANSION ****
   034210  004737  010274                      JSR     PC, $WAIT          ;CALL WAIT ROUTINE
   034214  000001                                      .WORD   1          ;FLAG THAT WE'RE WAITING FOR RDO
                                                                          ;****                   ****
   034216                                      BERROR  52$                ;IF ERROR - RDO NOT SET, END TEST
   034216  103552                                                                            BCS     52$
   034220  032777  000001  146006              BIT     #CNTRL,@SEL2       ;IS THIS A CONTROL OUT COMMAND ?
   034226  001405                              BEQ     25$                ;IF NOT - PROCEED
   034230                                      ERRDF   9,EMG9,ERRG2       ;UNEXPECTED CONTROL OUT RECEIVED
   034230  104455                                                                            TRAP    C$ERDF
   034232  000011                                                                            .WORD   9
   034234  020026                                                                            .WORD   EMG9
   034236  015112                                                                            .WORD   ERRG2
   034240  000541                              BR      52$
   034242                             25$:
   034242  032777  000004  145764              BIT     #RCV,@SEL2         ;TRANSMIT OR RECEIVE ?
   034250  001035                              BNE     40$                ;BR FOR RECEIVE

                                      ;CHECK TRANSMIT

   034252  005737  002516                      TST     TFLAG              ;IS THIS THE FIRST TRANSMIT DONE?
   034256  001405                              BEQ     30$                ;YES - OK
   034260                                      ERRDF   10,EMG10,ERRG2     ;ERROR MULTIPLE TRANSMITS
   034260  104455                                                                            TRAP    C$ERDF
   034262  000012                                                                            .WORD   10
   034264  020055                                                                            .WORD   EMG10
   034266  015112                                                                            .WORD   ERRG2
   034270  000525                              BR      52$
```

```
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                            BGNTST
034556                                                                            T14::
                                          .ENABL  LSB             ;ENABLE LOCAL BLOCK - NEEDED BECAUSE OF
                                                                  ;USE  OF SYMBOLIC LABELS "RSEL4" 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
```

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     47 034724  012761  000600  000006          MOV     #600,6(R1)       ;PAR 3, ADDRS  60000  -  77776
     48 034732  012761  001000  000010          MOV     #1000,10(R1)     ;PAR 4, ADDRS 100000  - 117776
     49 034740  012761  002000  000012          MOV     #2000,12(R1)     ;PAR 5, ADDRS 200000  - 217776
     50 034746  012761  004000  000014          MOV     #4000,14(R1)     ;PAR 6, ADDRS 400000  - 417776
     51 034754  012761  007600  000016          MOV     #7600,16(R1)     ;PAR 7, ADDRS 160000  - 177776 (I/O PAGE)
     52
     53 034762  012703  000100                  MOV     #64.,R3          ;COUNTER FOR OUTER LOOP OF TEST PATTERN GEN.
     54 034766  012704  120000                  MOV     #120000,R4       ;USE VIRTUAL ADDRESS TO MAP TO PAR 5
     55                                                                  ;GENERATE A TEST PATTERN IN THE 1ST 4K
     56                                                                  ;BYTES OF PAR 5 (VIRTUAL ADDR 120000 - 127776)
     57 034772  005037  002350                  CLR     NXMFLG           ;ENSURE FLAG IS CLEARED
     58 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$SVEC
        035020  062706  000010                                                                          ADD     #10,SP
     59 035024  012737  000001  177572          MOV     #1,@#177572      ;ENABLE MEMORY MANAGEMENT
     60 035032                          21$:
     61 035032  012701  000040                  MOV     #32.,R1          ;COUNTER FOR INNER LOOP OF TEST PATTERN GEN.
     62 035036  012702  002416                  MOV     #$CCITT,R2       ;ADDRESS FOR 32. WORD TEST PATTERN
     63 035042                          22$:
     64 035042  012224                          MOV     (R2)+,(R4)+      ;WRITE TEST PATTERN INTO 4K BYTES
     65                                                                  ;(PHYSICAL ADDRESS 200000 - 207776)
     66 035044  005737  002350                  TST     NXMFLG           ;NXM TRAP 4?
     67 035050  001014                          BNE     24$              ;IF YES - EXIT
     68 035052  005301                          DEC     R1               ;DO THE INNER LOOP 32. TIMES
     69 035054  001372                          BNE     22$
     70 035056  005303                          DEC     R3               ;DO THE OUTER LOOP 128. TIMES
     71 035060  001364                          BNE     21$
     72 035062  012701  004000                  MOV     #4000,R1         ;COUNTER TO CLEAR THE NEXT 4K BYTES.
     73 035066                          23$:
     74 035066  005024                          CLR     (R4)+            ;CLEAR OUT THE ENTIRE PAR
     75                                                                  ;(PHYSICAL ADDRESS 210000 - 217776)
     76 035070  005737  002350                  TST     NXMFLG           ;NXM TRAP 4?
     77 035074  001002                          BNE     24$              ;IF YES - EXIT
     78 035076  005301                          DEC     R1
     79 035100  001372                          BNE     23$
     80 035102                          24$:
     81 035102  005037  177572                  CLR     @#177572         ;TURN OFF MEMORY MANAGEMENT
     82 035106                                  CLRVEC  #4               ;RESTORE TRAP 4 TO SUPERVISOR
        035106  012700  000004                                                                          MOV     #4,R0
        035112  104436                                                                                  TRAP    C$CVEC
     83 035114  005737  002350                  TST     NXMFLG           ;WAS THIS AN ERROR EXIT
     84 035120  001417                          BEQ     25$              ;IF NOT, PROCEED.
     85 035122                                  ERRDF   19,EMT22
        035122  104455                                                                                  TRAP    C$ERDF
        035124  000023                                                                                  .WORD   19
        035126  036202                                                                                  .WORD   EMT22
        035130  000000                                                                                  .WORD   0
     86 035132                                  PRINTB  #FMT25,R4
        035132  010446                                                                                  MOV     R4,-(SP)
        035134  012746  036240                                                                          MOV     #FMT25,-(SP)
        035140  012746  000002                                                                          MOV     #2,-(SP)
        035144  010600                                                                                  MOV     SP,R0
        035146  104414                                                                                  TRAP    C$PNTB
```

```
035150  062706  000006                                                                          ADD     #6,SP
035154  000137  036200                  JMP     85$
035160                          25$:
035160                                  CLEAR                           ;MACRO FOR MASTER CLEAR
                                                                        ;**** MACRO EXPANSION ****
035160  004737  011066                  JSR     PC, $MSCLR              ;ISSUE A DMR MASTER CLEAR
                                                                        ;****                 ****

035164                                  ESCAPE  TST                     ;IF ERROR, BR TO TEST END.
035164  104410                                                                                  TRAP    C$ESCAPE
035166  001012                                                                                  .WORD   L10074-.

035170  005737  002254                  TST     DMTURN                  ;IS INTERNAL LOOPBACK DESIRED?
035174  001004                          BNE     30$                     ;IF NOT, CLEAR INTERNAL LOOPBACK.
035176  052737  004000  035220          BIS     #LPLU,100$              ;SET LINE UNIT LOOPBACK.
035204  000403                          BR      32$
035206                          30$:
035206  042737  004000  035220          BIC     #LPLU,100$              ;CLEAR LINE UNIT LOOPBACK.
035214                          32$:
035214                                  CALL    $BASEI                  ;BASE IN COMMAND.
035220  000000                  100$:           .WORD   0               ;MAINTENANCE BITS (LINE UNIT LOOP)
035222  002636                                  .WORD   BASE            ;BASE TABLE ADDRESS
035224  000522                                  .WORD   DMR             ;DMR MODE
035226                                  ESCAPE  TST                     ;IF ERROR, BR TO TEST END.
035226  104410                                                                                  TRAP    C$ESCAPE
035230  000750                                                                                  .WORD   L10074-.

035232                                  CALL    $LOOP                   ;DMR COMMAND TO SET MAINT. BITS
035236                                  ESCAPF  TST                     ;IF ERROR, BR TO TEST END.
035236  104410                                                                                  TRAP    C$ESCAPE
035240  000740                                                                                  .WORD   L10074-.

035242                                  CNTRIN                          ;MACRO FOR CONTROL IN (FULL DUPLEX)
                                                                        ;**** MACRO EXPANSION ****
035242  004737  011520                  JSR     PC, $CNTIN              ;CALL CONTROL IN ROUTINE WITH DEFAULT
035246  000000                                  .WORD   0               ;SEL6 - FULL DUPLEX, RUN MODE, 1 SEC START.
                                                                        ;****                 ****
035250                                  ESCAPE  TST                     ;IF ERROR, BR TO TEST END.
035250  104410                                                                                  TRAP    C$ESCAPE
035252  000726                                                                                  .WORD   L10074-.

035254  005037  002516                  CLR     TFLAG                   ;CLEAR TRANSMIT FLAG
035260  005037  002566                  CLR     RFLAG                   ;CLEAR RECEIVE FLAG
035264  005037  002344                  CLR     SFLAG                   ;CLEAR SECOND LOOP FLAG
                                                                        ;IF SFLAG = 0, THEN THIS IS A TEST OF BIT 16
                                                                        ;IF SFLAG = -1, THEN THIS IS A TEST OF BIT 17
035270  012737  010000  035324          MOV     #10000,RSEL4            ;RECEIVE BUFFER ADDRESS (BITS 0-15)
035276  012737  050000  035326          MOV     #BIT14!10000,RSEL6 ;REC BUFFER ADDR BIT 16 SET AND 4K
                                                                        ;BYTE RECEIVE CHARACTER COUNT
035304  005037  035342                  CLR     TSEL4                   ;TRANSMIT BUFFER ADDRESS (BITS 0-15)
035310  012737  050000  035344          MOV     #BIT14!10000,TSEL6 ;XMIT BUFFER ADDR BIT 16 SET AND 4K
                                                                        ;BYTE XMIT CHARACTER COUNT
035316                          35$:
035316                                  CALL    $BACC                   ;ISSUE THE BUFFER ADDR/ CHAR COUNT COMMAND
035322  000044                                  .WORD   RQI!BACCR               ;COMMAND FOR BA/CC IN RECEIVE
035324  000000                  RSEL4:          .WORD   0               ;BUFFER ADDRESS BITS 0-15
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, $WAIT       ;CALL WAIT ROUTINE
        035356  000001                                 .WORD   1       ;FLAG THAT WE'RE WAITING FOR RDO
                                                                       ;****                   ****
    137 035360                                 ESCAPE  TST             ;IF RDO NOT SET BEFORE TIMEOUT, END TEST
        035360  104410                                                                                TRAP    C$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
```

TEST 15 - DMC MODE (RESUME) INTERRUPT TEST

```
                                        .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
```

```

036362                                  CLEAR                    ;MASTER CLEAR
                                                                 ;**** MACRO EXPANSION ****
036362  004737  011066                  JSR     PC, $MSCLR       ;ISSUE A DMR MASTER CLEAR
                                                                 ;****                ****

036366                                  ESCAPE  TST              ;IF ERROR, EXIT TEST
036366  104410                                                                                   TRAP    C$ESCAPE
036370  000034                                                                                   .WORD   L10075-.


                                                                 ;ISSUE A DMR MODE BASEIN
                                                                 ;IN DMR MODE, IF A INTERFACE IS REQUIRED
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
                                                                 ;****                ****

036404                                  ESCAPE  TST              ;IF ERROR, EXIT TEST
036404  104410                                                                                   TRAP    C$ESCAPE
036406  000016                                                                                   .WORD   L10075-.
036410                                  SHUTDN                   ;HALT
                                                                 ;**** MACRO EXPANSION ****
036410  004737  012550                  JSR     PC, $HALT        ;DMR HALT ROUTINE.
                                                                 ;****                ****
036414                                  ESCAPE  TST              ;IF ERROR, EXIT TEST.
036414  104410                                                                                   TRAP    C$ESCAPE
036416  000006                                                                                   .WORD   L10075-.
                                                                 ;AFTER SETTING INTERFACE OR LOOPBACK MAINT.
                                                                 ;(CAN'T BE DONE IN DMC MODE), START IN
                                                                 ;DMC MODE.


036420                                  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

036424                          40$:
036424                          ENDTST
036424                                                                                   L10075:
036424  104401                                                                                   TRAP    C$ETST



```

```
                                        .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$ESCAPE
  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  104401                                                                          TRAP    C$ETST
     54
     1                                          .SBTTL          TEST 19 - DMR MAINTENANCE MODE MESSAGE
     2
     3                                          ;*****************************************************************
     4                                          ;*                      TEST 19 - DMR-11
     5                                          ;*  MAINTENANCE MODE OPERATION
     6                                          ;*
     7                                          ;*  THE BA/CC OUT RECEIVE AND TRANSMIT WILL BE ACCOUNTED FOR AND
     8                                          ;*  THE CHARACTER COUNTS AND BUFFER ADDRESSES WILL BE CHECKED AGAINST
     9                                          ;*  THE RECEIVE/TRANSMIT TABLE.
    10                                          ;*
    11                                          ;*         THE BUFFERS ARE DETERMINED IN THE SUBROUTINE $BUFFS.  THIS
    12                                          ;*         SUBROUTINE WILL DETERMINE THE ADDRESS AND CHARACTER COUNT OF
    13                                          ;*         ONE RECEIVE AND ONE TRANSMIT BUFFER.  THE ROUTINE WILL
    14                                          ;*         ATTEMPT TO USE AS LARGE BUFFERS AS POSSIBLE IN THE FOLLOWING
    15                                          ;*         HIERARCHY:
    16                                          ;*                      A. IF THERE IS MEMORY MANAGEMENT, USE A PAGE ABOVE 32K.
    17                                          ;*                      B. IF THERE IS FREE MEMORY ABOVE THE SUPERVISOR GREATER
    18                                          ;*                         THAN 2K BYTES, USE THAT MEMORY
    19                                          ;*                      C. IF NEITHER OF THE PRECEEDING TWO ARE POSSIBLE, USE
    20                                          ;*                         THE 2K BYTE DEFAULT BUFFER WITHIN THIS DIAGNOSTIC.
    21                                          ;*
    22                                          ;*****************************************************************
    23 036614                                   BGNTST
       036614                                                                    T19::
    24 036614  012737  000001  002324                   MOV     #1,BUFNUM       ;# OF RCV & XMIT BUFFERS.
    25
    26 036622  005037  002274                           CLR     RESUME          ;DON'T ALLOW RESUME
    27 036626  005037  002276                           CLR     DMCMDE          ;FLAG CLEARED TO ALLOW DMR MODE.
    28 036632  012737  000001  002300                   MOV     #1,MNTMDE       ;FLAG SET TO REQUEST MAINTENANCE MODE.
    29
    30 036640                                           CALL    $BUFFS          ;DETERMINE 1 RCV &  1 XMIT BUFFER
    31
    32 036644                                           CLEAR                   ;MASTER CLEAR
                                                                                ;**** MACRO EXPANSION ****
       036644  004737  011066                           JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                                                ;****                ****
    33
    34 036650                                           ESCAPE  TST             ;IF ERROR, EXIT TEST
       036650  104410                                                                          TRAP     C$ESCAPE
       036652  000012                                                                          .WORD    L10101-.
    35
    36 036654                                           CALL    $INOUT          ;THIS ROUTINE WILL MANAGE ALL THE DMR
    37                                                                          ;COMMANDS ISSUED IN THE INTERRUPT ROUTINES
    38                                                                          ;(FROM BASE IN UNTIL SHUT DOWN).  BESIDES
    39                                                                          ;CONTROLLING THE SOFTWARE TIMEOUT, THIS
    40                                                                          ;ROUTINE WILL ALSO CHECK THAT BUFFER
    41                                                                          ;CHARACTER COUNTS AND ADDRESSES ARE CORRECT
    42                                                                          ;AND THAT THE DATA IS CORRECT IN THOSE BUFFERS
    43
    44 036660                                           CALL    $ERROR          ;CHECK BASE TABLE FOR SOFT ERRORS
    45
    46
    47 036664                                   ENDTST
       036664                                                                    L10101:
       036664  104401                                                                          TRAP     C$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

   036722                                             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-10,/
     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
```

```
21                                              .EVEN
22
23                                      ;*******************          PATCH AREA      ******************************
24 037766                               PATCH:
25              040066                          .=.+100
26 040066       000240                          NOP
27 040070       000240                          NOP
28 040072       000240                          NOP
29                                      ;**********************************************************************
30 040074                               ENDMOD
31
32 040074                                       LASTAD
                                                                                                    .EVEN
   040074       000000                                                                              .WORD   0
   040076       000000                                                                              .WORD   0
   040100                               L$LAST::
33              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        UAM    = 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
```

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CROSS REFERENCE TABLE (CREF V01-05 )

$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     41-112    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
```

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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
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        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#
CLRNO   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
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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#
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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
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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$HW     14-15#    17-10     17-24
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F$MOD    14-15#   14-18    76-30
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         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$TEST   14-15#   51-19    51-47    53-32    53-197   54-29    54-51    56-17    56-83    57-16    57-86    58-20    58-107   59-15
         59-71    60-14    60-106   61-13    61-109   62-10    62-65    64-9     64-44    65-15    65-151   67-11    67-134   68-12
         68-258   70-46    70-83    71-46    71-68    72-24    72-48    73-24    73-53    74-23    74-47
FINIT1   45-55    45-172#
FINIT2   45-76    45-173#
FINIT3   45-163   45-174#
FLAG     20-100#  53-60*   53-134   53-137*  53-146   53-149*  53-163*  53-178   53-181*
FMDROP   49-11    49-16#
FMG1     42-10    42-32    42-41    42-133#  57-89
FMG10    42-95    42-141#
FMG11    42-108   42-142#
FMG12    42-102   42-143#
FMG13    42-103   42-109   42-144#
FMG14    42-110   42-145#
FMG15    42-104   42-146#
FMG16    42-115   42-147#
FMG17    42-119   42-148#
FMG18    42-125   42-149#
FMG19    42-59    42-150#  54-35
FMG2     42-11    42-33    42-134#
FMG21    42-12    42-151#
FMG22    42-13    42-152#
FMG23    42-22    42-153#
FMG24    42-23    42-154#
FMG3     42-9     42-30    42-39    42-67    42-135#
FMG4     42-46    42-136#
FMG5     42-51    42-54    42-137#
FMG7     42-74    42-138#  60-110
FMG8     42-81    42-139#
FMG9     42-88    42-140#
FMS1     28-75    28-98#
FMS2     28-84    28-99#
FMS3     32-56    32-75#
FMT0     51-58    51-63#
FMT1     53-40    53-198#
FMT11    57-90    57-117#
FMT12    57-93    57-118#
FMT13    57-97    57-119#
FMT14    57-101   57-120#
FMT15    57-105   57-121#
FMT16    57-109   57-122#
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FMT2     53-46     53-199#
FMT25    68-86     68-251    68-262#
FMT3     53-140    53-152    53-200#
FMT4     53-184    53-201#
FMT5     56-88     56-113#
FMT6     56-92     56-114#
FMT7     56-97     56-115#
FMT8     56-101    56-116#
FMT9     56-105    56-117#
FRSPAS   20-47#    45-22*    45-42*
FRSTIM   20-46#    45-19     45-21*
G$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
HLT      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#
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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
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         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
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         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
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         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#
L$DESP   15-11#
L$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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L10030  53-195#
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L10032  56-21     56-25     56-53     56-58     56-83#
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L10034  56-81#
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L10040  57-85#
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L10044  58-61#
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L10046  58-103#
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L10060  61-41#
L10061  61-74#
L10062  61-107#
L10063  62-13     62-23     62-26     62-29     62-36     62-38     62-65#
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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#
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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
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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#
SELO    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
        45-60*    45-61*    48-89*    48-269    48-275    48-328    48-357*   48-360*   51-34     57-89     60-42*    60-45     60-55*    60-58*
        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*
SEL4    20-17#    20-24     31-49*    33-56*    34-40*    42-11     42-33     42-103    42-109    45-64*    45-65*    48-78*    48-111*   48-119*
        48-128    48-129*   48-136*   48-142*   48-146*   48-307    48-309*   48-313*   48-318*   48-323*   48-326*   48-331    48-343    51-36
        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*
        42-11     42-33     42-103    42-109    45-68*    45-69*    48-56*    48-57*    48-60*    48-61*    48-69*    48-72*    48-82*    48-85*
        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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          32-36*    32-72*    33-38*    33-39*    33-73*    34-30*    34-31*    34-48*    35-28*    35-29*    35-58*    37-18*    37-19*    37-40*
          39-27*    39-28*    39-48*    40-35*    40-36*    40-205*   41-23*    41-24*    41-119*   42-9      42-28     42-30     42-37     42-39
          42-65     42-67     45-12*
SVCGBL    14-15#    14-26#    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     16-8      17-10
          17-10     18-8      18-8      22-13     22-18     42-8      42-27     42-36     42-64     42-101    42-107    42-114    42-118    42-122
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SW13     19-16#
SW14     19-15#
SW15     19-14#
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T$$CLE   47-9#     47-16
T$$DU    49-8#     49-13
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CZDMICO DMR-11 FUNCTIONAL TESTS MACRO V03.01 30-JUL-80 11:38:40 PAGE S-21                              SEQ   206
CROSS REFERENCE TABLE (CREF V01-05 )


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         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#
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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
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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
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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#
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LASTAD     1-;47#    14-16#    76-32
M$BYTE     1-D00#    14-16#    15-11     15-11     15-11     15-11#
M$CHEC     1-E18#    14-16#
M$CNTO     1-E82#    14-16#    75-15     75-15#    75-16     75-16#    75-17     75-17#    76-15     76-15#
M$COUN     1-D66#    14-16#    28-73     28-73#    28-82     28-82#    32-56     32-56#    42-9      42-9#     42-10     42-10     42-10#    42-11
          42-11     42-11#    42-12     42-12#    42-13     42-13#    42-22     42-22     42-22#    42-23     42-23     42-23#    42-30     42-30#
          42-32     42-32     42-32#    42-33     42-33     42-33#    42-39     42-39#    42-41     42-41     42-41#    42-46     42-46#    42-51
          42-51#    42-54     42-54#    42-59     42-59#    42-63     42-63#    42-71     42-71#    42-78     42-78     42-78#    42-85     42-85
          42-85#    42-92     42-92     42-92#    42-99     42-99     42-99#    42-106    42-106#   42-107    42-107    42-107#   42-108    42-108#
          42-112    42-112#   42-113    42-113    42-113#   42-114    42-114    42-114#   42-119    42-119    42-119#   42-123    42-123    42-123#
          42-129    42-129    42-129#   45-55     45-55     45-55#    45-76     45-76     45-76#    45-163    45-163#   49-11     49-11#    51-58
          51-58     51-58#    53-40     53-40#    53-46     53-46     53-46     53-46     53-46#    53-140    53-140    53-140    53-140#   53-152
          53-152    53-152    53-152#   53-184    53-184    53-184    53-184#   54-35     54-35#    56-88     56-88#    56-92     56-92#    56-97
          56-97#    56-101    56-101#   56-105    56-105#   57-89     57-89     57-89#    57-90     57-90#    57-93     57-93#    57-97     57-97#
          57-101    57-101#   57-105    57-105#   57-109    57-109#   59-76     59-76     59-76#    60-110    60-110    60-110#   68-86     68-86#
          68-251    68-251#
M$DATA     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#    22-13
          22-13#    22-18     22-18#
M$DECR     1-D29#    14-16#    17-24     17-24#    18-12     18-12#    42-24     42-24#    42-34     42-34#    42-65     42-65#    42-101    42-101#
          42-109    42-109#   42-115    42-115#   42-120    42-120#   42-124    42-124#   42-130    42-130#   44-14     44-14#    45-171    45-171#
          46-28     46-28#    47-16     47-16#    48-262    48-262#   48-362    48-362#   48-371    48-371#   49-13     49-13#    51-47     51-47#
          51-60     51-60#    53-56     53-56#    53-160    53-160#   53-195    53-195#   53-197    53-197#   54-51     54-51#    56-48     56-48#
          56-81     56-81#    56-83     56-83#    56-107    56-107#   57-48     57-48#    57-85     57-85#    57-86     57-86#    57-111    57-111#
          58-44     58-44#    58-60     58-60#    58-78     58-78#    58-102    58-102#   58-106    58-106#   59-50     59-50#    59-69     59-69#
          59-71     59-71#    59-77     59-77#    60-61     60-61#    60-105    60-105#   60-106    60-106#   60-111    60-111#   61-41     61-41#
          61-74     61-74#    61-107    61-107#   61-109    61-109#   62-48     62-48#    64-44     64-44#    65-40     65-40#    65-68     65-68#
          65-92     65-92#    65-122    65-122#   65-149    65-149#   65-151    65-151#   67-134    67-134#   68-258    68-258#   70-83     70-83#
          71-68     71-68#    72-48     72-48#    73-53     73-53#    74-47     74-47#    75-19     75-19#    76-17     76-17#    76-30     76-30#
M$DEFA     1-E70#    14-16#    75-15     75-15#    75-16     75-16#    75-17     75-17#    76-15     76-15#
M$ENDE     1-D74#    14-16#    17-24#    18-12#    42-24#    42-34#    42-65#    42-101#   42-109#   42-115#   42-120#   42-124#   42-130#   45-171#
          46-28#    47-16#    48-262#   48-362#   48-371#   49-13#    51-47#    51-60#    53-56#    53-160#   53-195#   53-197#   54-51#    56-48#
          56-81#    56-83#    56-107#   57-48#    57-85#    57-86#    57-111#   58-44#    58-60#    58-78#    58-102#   58-106#   59-50#    59-69#
          59-71#    59-77#    60-61#    60-105#   60-106#   60-111#   61-41#    61-74#    61-107#   61-109#   62-48#    64-44#    65-40#    65-68#
          65-92#    65-122#   65-149#   65-151#   67-134#   68-258#   70-83#    71-68#    72-48#    73-53#    74-47#    75-19#    76-17#    76-30#
M$ERRI     1-@49#    14-16#    28-65     28-65#    28-76     28-76#    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#    58-35     58-35#    58-42     58-42#
          58-56     58-56#    58-76     58-76#    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#   62-39     62-39#    62-44     62-44#    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#
M$ESCA     1-D06#    14-16#    54-32     54-32#    54-41     54-41#    56-21     56-21#    56-25     56-25#    56-53     56-53#    56-58     56-58#
          57-20     57-20#    57-24     57-24#    57-27     57-27#    57-29     57-29#    57-40     57-40#    57-42     57-42#    57-53     57-53#
          57-57     57-57#    57-60     57-60#    57-69     57-69#    57-71     57-71#    58-24     58-24#    58-27     58-27#    58-30     58-30#
          58-39     58-39#    58-51     58-51#    58-65     58-65#    58-68     58-68#    58-71     58-71#    58-73     58-73#    58-84     58-84#
          58-96     58-96#    58-100    58-100#   59-20     59-20#    59-23     59-23#    59-33     59-33#    59-37     59-37#    59-45     59-45#
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