DMR-11

DMR-11 FCTNL DIAG
CZDMIDO

AH-F832D-MC
FICHE 1 OF 2

DMR-11

DMR-11 FCTNL DIAG
CZDMIDO

AH-F832D-MC
FICHE 2 OF 2

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IDENTIFICATION

PRODUCT CODE: AC-F830D-MC

PRODUCT NAME: CZDMIDO DMR-11 FCTNL DIAG

PRODUCT DATE: OCTOBER 1981

MAINTAINER: DIAGNOSTIC ENGINEERING

AUTHOR: MIKE O'CONNOR

REVISION HISTORY

REVISION	REASON	DATE
A	INITIAL RELEASE	5 FEB 80
B	1. SUPPORT REMOTE LOOPBACK IN TESTS 17-19 2. BUG FIX - CONTROL C EXIT OF PROGRAM WOULD CAUSE UNEXPECTED INTERRUPT ON RESTART - PUT MASTER CLEAR IN CLEAN UP CODE 3. BUG FIX - DTR WAS DROPPED WHEN WRITING MODEM MAINTENANCE BIT (AFFECTED MANUF. TURNAROUND.)	17 APR 80
C	ADDED CHECK OF M8207 PROGRAM TIMER IN TEST 10	20 AUG 80
D	1. AT ENGINEERING'S REQUEST, CHANGED TEST 15 SO THAT IT NO LONGER TESTS DMC MODE BASE IN RESUME. ALSO CHANGED TEST 16 SO THAT A MASTER CLEAR IS DONE BEFORE A BASE IN RESUME AND TEST 16 NOW ONLY RUNS IN INTERNAL LOOPBACK MAKING THESE CHANGES GETS AROUND A PROBLEM IN MANUFACTURING. THE DMR DOCUMENTATION WAS CHANGED TO SPECIFY THAT A MASTER CLEAR MUST BE DONE BEFORE A BASE IN RESUME. 2. BUG FIX - ALLOWED 1 REP TO BE SENT IN TEST 14. THIS IS NECESSARY TO MASK THE SOFT ERROR MESSAGE THAT CAN OCCUR WHEN LARGE MESSAGES ARE SENT AT LOW BAUD RATES.	26 OCT 81

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.

2.0 HARDWARE REQUIREMENTS

THE FOLLOWING HARDWARE IS REQUIRED TO RUN THE DMP-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
BOF	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 -TABLES, AND IF THERE IS NOT ENOUGH TO ACCOMMODATE THEM THE MESSAGE "TOO MANY UNITS" IS ISSUED. IN THIS CASE THE DIAGNOSTIC MUST BE EXECUTED MORE THAN ONCE TO TEST ALL UNITS.

EXAMPLE:

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

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

6.3.2 RESTART COMMAND

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

6.3.2.1 TESTS, PASS, AND FLAGS SWITCHES

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

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

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

6.3.2.3 EFFECT OF RESTART COMMAND

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

6.3.3 CONTINUE COMMAND

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

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

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

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

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

6.3.3.3 EFFECT OF CONTINUE COMMAND

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

6.3.4 PROCEED COMMAND

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

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

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

```
                        6.3.4.2 EFFECT OF PROCEED COMMAND

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



                        6.3.5 ADD COMMAND

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


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

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


                        6.3.5.2 EFFECT OF ADD COMMAND

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


                        6.3.6 DROP COMMAND

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


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

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


                        6.3.6.2 EFFECT OF DROP COMMAND

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


                        6.3.7 PRINT COMMAND

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

```
                        **********************************************************************


                        6.3.7.1 EFFECT OF PRINT COMMAND

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


                        6.3.8 DISPLAY COMMAND

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


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

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


                        6.3.8.2 EFFECT OF DISPLAY COMMAND

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


                        6.3.9 FLAGS COMMAND

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


                        6.3.9.1 EFFECT OF FLAGS COMMAND

                        THE CURRENT SETTINGS OF ALL FLAGS ARE PRINTED.


                        6.3.10 ZFLAGS COMMAND

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


                        6.3.10.1 EFFECT OF ZFLAGS COMMAND

                        ALL FLAGS ARE CLEARED.


                        6.3.11  CONTROL  CHARACTERS
```

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

A CONTROL Z (Z) ENTERED DURING ONE OF THE THREE OPERATOR DIALOGUES- HARD CORE QUESTIONS (SEE 6.2),HARDWARE DIALOGUE (SEE 6.3.1.5), OR SOFTWARE DIALOGUE (SEE 6.3.1.5) CAUSES THE DEFAULTS TO BE TAKEN FOR THE REMAINDER OF THAT DIALOGUE.

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

6.3.12 HARDWARE PARAMETERS

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

1. CSR ADDRESS: (O) 160070?

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

2. VECTOR ADDRESS: (O) 300 ?

THIS IS THE ADDRESS OF THE INPUT INTERRUPT VECTOR FOR THIS DEVICE. THE ALLOWABLE RANGE IS 000-776 (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
     (0)  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
```

```
793
794                    THE  FIRST  TIME THE SERIES IS ASKED, SLOT ONE RECEIVES A 75
795                    IN ALL 16 TABLES.  SLOT TWO RECEIVES THE VALUES 0,1,2,...,6
796                    IN  TABLES 0 THRU 6 AND A CONSTANT 6 IN TABLES 7 THRU 15.
797                    SLOT THREE RECEIVES A CONSTANT 76 IN ALL 16 TABLES.
798
799                    THE SECOND TIME THRU THE SERIES, TABLES 7 THRU THE END  ARE
800                    GOING TO BE AFFECTED (NOTE THAT THIS PIECE OF INFORMATION IS
801                    PRINTED OUT FOR THE THE OPERATOR IN THE FORM 'UNIT  XX'' AT
802                    THE  BEGINNING  OF EACH SERIES).  QUESTION 1 IS RESPONDED TO
803                    BY A <CR>, SO SLOT ONE STAYS AT CONSTANT  75  IN  TABLES  7
804                    THRU 15, SINCE NO NEW EXPLICIT VALUES ARE TYPED IN.  SLOT TWO
805                    GETS THE VALUES 7,8,9,10,11 IN TABLES 7  THRU  11,  AND
806                    GETS AN 11 IN SLOT 12, AND GETS THE VALUES 13,14,15 IN
807                    TABLES 13 THRU 15. SLOT THREE GETS THE VALUE 77 IN TABLES 7
808                    THRU 15.
809
810                    THE DIALOGUE IS TERMINATED WHEN THE SOFTWARE RECOGNIZES THAT
811                    16 EXPLICIT VALUES HAVE BEEN GIVEN FOR AT LEAST ONE QUESTION
812                    (NAMELY QUESTION 2).
813
```

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

```
1014
1015                            ;*******************************************************************************
1016                            ;*                TEST 12 - DMR-11
1017                            ;*  PROCEDURE ERRORS -
1018                            ;*  THE FOLLOWING SHOULD CAUSE THE DMR-11 TO HALT AND RESPOND WITH
1019                            ;*  A PROCEDURE ERROR:
1020                            ;*  SUBTEST 1  -  A SECOND BASE IN COMMAND
1021                            ;*  SUBTEST 2  -  A CONTROL IN BEFORE A BASE IN
1022                            ;*  SUBTEST 3  -  A BA/CC IN BEFORE A BASE IN
1023                            ;*  SUBTEST 4  -  A BA/CC IN RCV WITH A BUFFER LENGTH OF 0
1024                            ;*  SUBTEST 5  -  A BA/CC IN XMIT. WITH A BUFFER LENGTH OF 0
1025                            ;*
1026                            ;*******************************************************************************
1027
1028
1029
1030
1031                            ;*******************************************************************************
1032                            ;*                TEST 13 - DMR-11
1033                            ;* FREE RUNNING FLAG MODE DATA TEST
1034                            ;* TRANSMIT A MESSAGE AND VERIFY THE RECEIVED DATA IS CORRECT.
1035                            ;* IN THIS TEST NO INTERRUPTS ARE USED AND THE LINE UNIT IS IN
1036                            ;* INTERNAL (TTL) LOOPBACK.  THIS TEST IS THE FIRST TEST IN WHICH
1037                            ;* THE DMR IS USED IN A DATA TRANSMISSION MODE.
1038                            ;*******************************************************************************
1039
1040
1041
1042
1043                            ;*******************************************************************************
1044                            ;*                TEST  14 - DMR-11
1045                            ;* IN THIS TEST - SEE IF WE HAVE MEMORY MANAGEMENT, IF SO SEE IF WE
1046                            ;* HAVE THE MEMORY TO CHECK BITS 16 & 17 IN SEL6.  THIS WILL ALLOW
1047                            ;* US TO TRANSFER DATA USING THOSE EXTENDED ADDRESSING BITS. AS IN
1048                            ;* TEST 13 THE TEST IS NON-INTERRUPT AND INTERNAL (TTL) LOOPBACK IS
1049                            ;* USED.
1050                            ;*
1051                            ;*******************************************************************************
1052
```

```
1053
1054                    ;*********************************************************************
1055                    ;*              TEST 15 - DMR-11
1056                    ;* DMC MODE
1057                    ;* IN THIS TEST THE DMR WILL TRANSMIT AND RECEIVE 7 BUFFERS.
1058                    ;*
1059                    ;*      ALL BA/CC OUTS RECEIVES AND TRANSMITS WILL BE ACCOUNTED FOR AND
1060                    ;*      THE CHARACTER COUNTS AND BUFFER ADDRESSES WILL BE CHECKED AGAINST
1061                    ;*      THE RECEIVE/TRANSMIT TABLE.
1062                    ;*
1063                    ;*      THE BUFFERS ARE DETERMINED IN THE SUBROUTINE $BUFFS.  THIS
1064                    ;*      SUBROUTINE WILL DETERMINE THE ADDRESS AND CHARACTER COUNT OF
1065                    ;*      SEVEN RECEIVE AND SEVEN TRANSMIT BUFFERS.  THE ROUTINE WILL
1066                    ;*      ATTEMPT TO USE AS LARGE BUFFERS AS POSSIBLE IN THE FOLLOWING
1067                    ;*      HIERARCHY:
1068                    ;*              A. IF THERE IS MEMORY MANAGEMENT, USE A PAGE ABOVE 32K.
1069                    ;*              B. IF THERE IS FREE MEMORY ABOVE THE SUPERVISOR GREATER
1070                    ;*                 THAN 2K BYTES, USE THAT MEMORY
1071                    ;*              C. IF NEITHER OF THE PRECEEDING TWO ARE POSSIBLE, USE
1072                    ;*                 THE 2K BYTE DEFAULT BUFFER WITHIN THIS DIAGNOSTIC.
1073                    ;*
1074                    ;*********************************************************************
1075
```

```
1076
1077                    ;*************************************************************************
1078                    ;*              TEST 16 - DMR-11
1079                    ;* RESUME BASE IN - DMR MODE
1080                    ;* IN THIS TEST THE DMR WILL TRANSMIT AND RECEIVE 7 BUFFERS. DURING THE
1081                    ;* TEST THE DMR WILL BE HALTED AND RESTARTED BY A BASE-IN RESUME IN THE
1082                    ;* FOLLOWING MANNER:
1083                    ;*      BASE IN
1084                    ;*      CONTROL IN
1085                    ;*      HALT    MASTER CLEAR    BASE IN RESUME
1086                    ;*      2 BA/CC IN RECEIVE
1087                    ;*      HALT    MASTER CLEAR    BASE IN RESUME
1088                    ;*      2 BA/CC IN RECEIVE
1089                    ;*      HALT    MASTER CLEAR    BASE IN RESUME
1090                    ;*      2 BA/CC IN RECEIVE
1091                    ;*      HALT    MASTER CLEAR    BASE IN RESUME
1092                    ;*      1 BA/CC IN RECEIVE
1093                    ;*      HALT    MASTER CLEAR    BASE IN RESUME
1094                    ;*      2 BA/CC IN TRANSMIT
1095                    ;*      HALT    MASTER CLEAR    BASE IN RESUME
1096                    ;*      2 BA/CC IN TRANSMIT
1097                    ;*      HALT    MASTER CLEAR    BASE IN RESUME
1098                    ;*      2 BA/CC IN TRANSMIT
1099                    ;*      HALT    MASTER CLEAR    BASE IN RESUME
1100                    ;*      1 BA/CC IN TRANSMIT
1101                    ;*      HALT    MASTER CLEAR    BASE IN RESUME
1102                    ;*
1103                    ;*      ALL BA/CC OUTS RECEIVES AND TRANSMITS WILL BE ACCOUNTED FOR AND
1104                    ;*      THE CHARACTER COUNTS AND BUFFER ADDRESSES WILL BE CHECKED AGAINST
1105                    ;*      THE RECEIVE/TRANSMIT TABLE.
1106                    ;*
1107                    ;*      THE BUFFERS ARE DETERMINED IN THE SUBROUTINE $BUFFS.  THIS
1108                    ;*      SUBROUTINE WILL DETERMINE THE ADDRESS AND CHARACTER COUNT OF
1109                    ;*      SEVEN RECEIVE AND SEVEN TRANSMIT BUFFERS.  THE ROUTINE WILL
1110                    ;*      ATTEMPT TO USE AS LARGE BUFFERS AS POSSIBLE IN THE FOLLOWING
1111                    ;*      HIERARCHY:
1112                    ;*              A. IF THERE IS MEMORY MANAGEMENT, USE A PAGE ABOVE 32K.
1113                    ;*              B. IF THERE IS FREE MEMORY ABOVE THE SUPERVISOR GREATER
1114                    ;*                 THAN 2K BYTES, USE THAT MEMORY
1115                    ;*              C. IF NEITHER OF THE PRECEEDING TWO ARE POSSIBLE, USE
1116                    ;*                 THE 2K BYTE DEFAULT BUFFER WITHIN THIS DIAGNOSTIC.
1117                    ;*
1118                    ;*      THIS TEST RUNS IN INTERNAL TTL ONLY
1119                    ;*
1120                    ;*************************************************************************
1121
```

```
1122
1123                    ;*********************************************************************
1124                    ;*              TEST 17 - DMR-11
1125                    ;* INTERRUPT DRIVEN EXERCISE
1126                    ;* IN THIS TEST 64 BUFFERS WILL BE TRANSMITTED AND RECEIVED
1127                    ;*
1128                    ;* ALL BA/CC OUTS RECEIVES AND TRANSMITS WILL BE ACCOUNTED FOR AND
1129                    ;* THE CHARACTER COUNTS AND BUFFER ADDRESSES WILL BE CHECKED AGAINST
1130                    ;* THE RECEIVE/TRANSMIT TABLE.
1131                    ;*
1132                    ;*      THE BUFFERS ARE DETERMINED IN THE SUBROUTINE $BUFFS.  THIS
1133                    ;*      SUBROUTINE WILL DETERMINE THE ADDRESS AND CHARACTER COUNT OF
1134                    ;*      64 RECEIVE AND 64 TRANSMIT BUFFERS.  THE ROUTINE WILL
1135                    ;*      ATTEMPT TO USE AS LARGE BUFFERS AS POSSIBLE IN THE FOLLOWING
1136                    ;*      HIERARCHY:
1137                    ;*              A. IF THERE IS MEMORY MANAGEMENT, USE A PAGE ABOVE 32K.
1138                    ;*              B. IF THERE IS FREE MEMORY ABOVE THE SUPERVISOR GREATER
1139                    ;*                 THAN 2K BYTES, USE THAT MEMORY
1140                    ;*              C. IF NEITHER OF THE PRECEEDING TWO ARE POSSIBLE, USE
1141                    ;*                 THE 2K BYTE DEFAULT BUFFER WITHIN THIS DIAGNOSTIC.
1142                    ;*
1143                    ;*********************************************************************
1144
1145
1146                    ;*********************************************************************
1147                    ;*              TEST  18 - DMR-11
1148                    ;* LARGE MESSAGE
1149                    ;* IN THIS MODE TRANSMIT AND RECEIVE 1 LARGE BUFFER
1150                    ;*
115'                    ;* THE BA/CC OUT RECEIVE AND TRANSMIT WILL BE ACCOUNTED FOR AND
115:                    ;* THE CHARACTER COUNTS AND BUFFER ADDRESSES WILL BE CHECKED AGAINST
1153                    ;* THE RECEIVE/TRANSMIT TABLE.
1154                    ;*
1155                    ;*      THE BUFFERS ARE DETERMINED IN THE SUBROUTINE $BUFFS.  THIS
1156                    ;*      SUBROUTINE WILL DETERMINE THE ADDRESS AND CHARACTER COUNT OF
1157                    ;*      ONE RECEIVE AND ONE TRANSMIT BUFFER.  THE ROUTINE WILL
1158                    ;*      ATTEMPT TO USE AS LARGE BUFFERS AS POSSIBLE IN THE FOLLOWING
1159                    ;*      HIERARCHY:
1160                    ;*              A. IF THERE IS MEMORY MANAGEMENT, USE A PAGE ABOVE 32K.
1161                    ;*              B. IF THERE IS FREE MEMORY ABOVE THE SUPERVISOR GREATER
1162                    ;*                 THAN 2K BYTES, USE THAT MEMORY
1163                    ;*              C. IF NEITHER OF THE PRECEEDING TWO ARE POSSIBLE  USE
1164                    ;*                 THE 2K BYTE DEFAULT BUFFER WITHIN THIS DIAGNOSTIC.
1165                    ;*
1166                    ;*********************************************************************
1167
```

```
1168
1169                    ;*************************************************************************
1170                    ;*              TEST 19 - DMR-11
1171                    ;* MAINTENANCE MODE OPERATION
1172                    ;*
1173                    ;* THE BA/CC OUT RECEIVE AND TRANSMIT WILL BE ACCOUNTED FOR AND
1174                    ;* THE CHARACTER COUNTS AND BUFFER ADDRESSES WILL BE CHECKED AGAINST
1175                    ;* THE RECEIVE/TRANSMIT TABLE.
1176                    ;*
1177                    ;*      THE BUFFERS ARE DETERMINED IN THE SUBROUTINE $BUFFS.  THIS
1178                    ;*      SUBROUTINE WILL DETERMINE THE ADDRESS AND CHARACTER COUNT OF
1179                    ;*      ONE RECEIVE AND ONE TRANSMIT BUFFER.  THE ROUTINE WILL
1180                    ;*      ATTEMPT TO USE AS LARGE BUFFERS AS POSSIBLE IN THE FOLLOWING
1181                    ;*      HIERARCHY:
1182                    ;*              A. IF THERE IS MEMORY MANAGEMENT, USE A PAGE ABOVE 32K.
1183                    ;*              B. IF THERE IS FREE MEMORY ABOVE THE SUPERVISOR GREATER
1184                    ;*                 THAN 2K BYTES, USE THAT MEMORY
1185                    ;*              C. IF NEITHER OF THE PRECEEDING TWO ARE POSSIBLE, USE
1186                    ;*                 THE 2K BYTE DEFAULT BUFFER WITHIN THIS DIAGNOSTIC.
1187                    ;*
1188                    ;*************************************************************************
1189
1190                    9.0 ERROR INFORMATION
1191
1192
1193                    9.1 ERROR REPORTING
1194
1195                    ERRORS  ARE  REPORTED  BY  THE PROGRAM AS THEY OCCUR (IF NOT
1196                    INHIBITED). THE REPORT CONFORMS TO THE DIAGNOSTIC SUPERVISOR
1197                    ERROR  REPORT  FORMAT,  AND CONSISTS OF A DESCRIPTION OF THE
1198                    ERROR, THE TEST NUMBER, SUBTEST  NUMBER,  PC  OF  THE  ERROR
1199                    CALL,   DEVICE   ADDRESS,   AND  BASIC  AND  EXTENDED  ERROR
1200                    INFORMATION.
1201
1202                    THE FOLLOWING EXAMPLE PROVIDES A TYPICAL ERROR REPORT, WHICH
1203                    DESCRIBES  AN  "IRDY  NOT SET" ERROR, AND PROVIDES THE PC OF
1204                    THE ERROR CALL AND THE PC OF  THE  CALL  TO  THE  SUBROUTINE
1205                    REPORTING IT, THE FAILING REGISTER NAME, AND DEVICE REGISTER
1206                    CONTENTS :
1207
1208                      CZDMI DVC FTL ERR 00002 ON UNIT 00 TST 006 SUB 000 PC:  016210
1209                      TIME OUT
1210                      ERROR IN SUBROUTINE CALLED AT PC: 036174
1211                      BUFFER STATUS
1212                      # OF BUFFERS: 7
1213                      BUFFER SIZE: 2048
1214                      IN  - RCV ASSIGNED:  7       XMIT ASSIGNED:  7
1215                      OUT - RCV RETURNED:  0       XMIT RETURNED:  0
1216                      DMR RUN ACKNOWLEDGE NOT RCVD
1217                      (CHECK INTERFACE, BAUD AND TURNAROUND)
1218
1219                    ALL THE MESSAGES IN THE DIAGNOSTIC USE BASIC MESSAGE CALLS.
1220                    THEREFORE THE INHIBIT EXTENDED ERROR FLAG WILL HAVE NO
1221                    EFFECT ON THE MESSAGE OUTPUT.  THE INHIBIT BASIC MESSAGES WILL
1222                    INHIBIT THE ERROR MESSAGES.
1223                    @
```

```
1224          002000                          .=2000
1225
1226
1227
1228
1229                                          .MCALL  SVC
1230  002000                                  SVC                                   ; INITIALIZE SUPERVISOR MACROS
1231
1232
1233  002000                          BGNMOD
1234
1235
1236          000001                  $LSTIN=   1     ;   LIST INSTRUCTIONS
1237          000001                  $LSTTAG=  1
1238          000001                  SVCINS=   1     ;   LIST INSTRUCTIONS, SHIFTED RIGHT
1239          000001                  SVCTST=   1     ;   LIST TEST TAGS, SHIFTED RIGHT
1240          000001                  SVCSUB=   1     ;   LIST SUBTEST TAGS, SHIFTED RIGHT
1241          000001                  SVCGBL=   1     ;   LIST GLOBAL TAGS, SHIFTED RIGHT
1242          000001                  SVCTAG=   1     ;   LIST OTHER TAGS, SHIFTED RIGHT
1243
1244                                  ;       CHANGE THE VALUES OF THE SVC... SYMBOLS TO BE ZERO IF YOU WISH
1245                                  ;       TO ALIGN THE MACRO CALLS AND THEIR EXPANSIONS.  CHANGE THE
1246                                  ;       SYMBOLS TO BE MINUS-ONE TO NOT LIST THE EXPANSIONS.  YOU MAY
1247                                  ;       CHANGE THE SYMBOLS AT ANY POINT IN YOUR PROGRAM.
1248
1249  002000                            POINTER BGNSW,BGNDU,BGNSFT
1250
1251
1252
1253
```

```
1254                                    .SBTTL  PROGRAM HEADER
1255                                    ;++
1256                                    ;       THE PROGRAM HEADER MACRO CHARACTERIZES THIS DIAGNOSTIC. THE
1257                                    ;       HEADER MACRO'S ARGUMENTS ARE FILE NAME, RELEASE LEVEL, PATCH
1258                                    ;       DISPOSITION OF THE MOST RECENT PATCH, MAXIMUM TEST TIME IN SEC.,
1259                                    ;       AND THE TYPE OF DIAGNOSTIC (0-SEQUENTIAL, 1-EXERCISER).  THESE
1260                                    ;       ARGUMENTS ARE IN RESPECTIVE ORDER.
1261                                    ;--
1262
1263
1264  002000                            HEADER CZDMI,D,0,600.,0
1265  002000                                                          L$NAME::
1266  002000  103                                                             .ASCII /C/
1267  002001  132                                                             .ASCII /Z/
1268  002002  104                                                             .ASCII /D/
1269  002003  115                                                             .ASCII /M/
1270  002004  111                                                             .ASCII /I/
1271  002005  000                                                             .BYTE   0
1272  002006  000                                                             .BYTE   0
1273  002007  000                                                             .BYTE   0
1274  002010                                                          L$REV::
1275  002010  104                                                             .ASCII  /D/
1276  002011                                                          L$DEPO::
1277  002011  060                                                             .ASCII  /0/
1278  002012                                                          L$UNIT::
1279  002012  000000                                                          .WORD   0
1280  002014                                                          L$TIML::
1281  002014  001130                                                          .WORD   600.
1282  002016                                                          L$HPCP::
1283  002016  036744                                                          .WORD   L$HARD
1284  002020                                                          L$SPCP::
1285  002020  037700                                                          .WORD   L$SOFT
1286  002022                                                          L$HPTP::
1287  002022  002174                                                          .WORD   L$HW
1288  002024                                                          L$SPTP::
1289  002024  002224                                                          .WORD   L$SW
1290  002026                                                          L$LADP::
1291  002026  040100                                                          .WORD   L$LAST
1292  002030                                                          L$STA::
1293  002030  000000                                                          .WORD   0
1294  002032                                                          L$CO::
1295  002032  000000                                                          .WORD   0
1296  002034                                                          L$DTYP::
1297  002034  000000                                                          .WORD   0
1298  002036                                                          L$APT::
1299  002036  000000                                                          .WORD   0
1300  002040                                                          L$DTP::
1301  002040  002124                                                          .WORD   L$DISPATCH
1302  002042                                                          L$PRIO::
1303  002042  000000                                                          .WORD   0
1304  002044                                                          L$ENVI::
1305  002044  000000                                                          .WORD   0
1306  002046                                                          L$EXP1::
1307  002046  000000                                                          .WORD   0
1308  002050                                                          L$MREV::
1309  002050  003                                                             .BYTE   C$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  010240                    .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  023640                    .WORD   L$DU
002074                  L$LUN::
002074  000000                    .WORD   0
002076                  L$DESP::
002076  010246                    .WORD   L$DESC
002100                  L$LOAD::
002100  104035                    EMT     E$LOAD
002102                  L$ETP::
002102  000000                    .WORD   0
002104                  L$ICP::
002104  020452                    .WORD   L$INIT
002106                  L$CCP::
002106  022046                    .WORD   L$CLEAN
002110                  L$ACP::
002110  021756                    .WORD   L$AUTO
002112                  L$PRT::
002112  020444                    .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
```

```
                                .SBTTL  DISPATCH TABLE

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

                                        DISPATCH 19
002122                                                                          .WORD   19
002122  000023                                                        L$DISPATCH::
002124                                                                  .WORD   T1
002124  023720                                                          .WORD   T2
002126  024230                                                          .WORD   T3
002130  025544                                                          .WORD   T4
002132  025676                                                          .WORD   T5
002134  026724                                                          .WORD   T6
002136  030136                                                          .WORD   T7
002140  030716                                                          .WORD   T8
002142  031340                                                          .WORD   T9
002144  032042                                                          .WORD   T10
002146  032554                                                          .WORD   T11
002150  033000                                                          .WORD   T12
002152  033160                                                          .WORD   T13
002154  034064                                                          .WORD   T14
002156  034614                                                          .WORD   T15
002160  036360                                                          .WORD   T16
002162  036462                                                          .WORD   T17
002164  036550                                                          .WORD   T18
002166  036620                                                          .WORD   T19
002170  036670
```

```
1397                                    .SBTTL  DEFAULT HARDWARE P-TABLE
1398
1399                                    ;////////////////////////////////////////////////////////////////////////////
1400                                    ;/ THE DEFAULT HARDWARE P-TABLE CONTAINS DEFAULT VALUES OF
1401                                    ;/ THE TEST-DEVICE PARAMETERS.  **NOTE - MANY OF THE P-TABLE VALUES LISTED
1402                                    ;/ BELOW ARE NOT USED IN THIS DIAGNOSTIC BUT ARE INCLUDED TO AGREE WITH
1403                                    ;/ M8207 & M8203 DIAGNOSTIC P-TABLES.
1404                                    ;////////////////////////////////////////////////////////////////////////////
1405
1406  002172                                BGNHW   DFPTBL
1407  002172  000013                                                       .WORD   L10000-L$HW/2
1408  002174                                                              L$HW::
1409  002174                                                              DFPTBL::
1410
1411  002174  000000                       .WORD       0          ;**NOT USED - MICROPROCESSOR TYPE
1412  002176  160170                       .WORD  160170          ;DMR11 CSR UNIBUS ADDRESS DEFAULT
1413  002200  000300                       .WORD     300          ;DMR11 INTERRUPT VECTOR DEFAULT
1414  002202  000000                       .WORD       0          ;**NOT USED - PRIORITY LEVEL
1415  002204  000000                       .WORD       0          ;**NOT USED - LINE UNIT
1416  002206  000000                       .WORD     000          ;**NOT USED - SWITCH PACK #1 (REG 11)
1417  002210  000000                       .WORD     000          ;**NOT USED - SWITCH PACK #2 (REG 15)
1418  002212  000000                       .WORD     000          ;**NOT USED - SWITCH PACK #3 (REG 16)
1419  002214  000005                       .WORD       5          ;CABLE TURNAROUND (DEFAULT = CABLE(5))
1420  002216  000000                       .WORD       0          ;**NOT USED - BAUD RATE
1421  002220  000000                       .WORD       0          ;**NOT USED - RUN SWITCH
1422
1423  002222                                ENDHW
1424  002222                                                              L10000:
1425
1426
1427
1428
1429
1430
```

```
1431                                    .SBTTL  DEFAULT SOFTWARE P-TABLE
1432
1433                                    ;////////////////////////////////////////////////////////////////////////////
1434                                    ;/ THE SOFTWARE P-TABLE CONTAINS THE VALUE OF THE PROGRAM
1435                                    ;/ PARAMETERS THAT CAN BE CHANGED BY THE OPERATOR.
1436                                    ;////////////////////////////////////////////////////////////////////////////
1437
1438  002222                                    BGNSW   SFPTBL
1439  002222  000001                                                                    .WORD   L10001-L$SW/2
1440  002224                                                                    L$SW::
1441  002224                                                                    SFPTBL::
1442
1443  002224  000005                    SPEED:  .WORD   5       ;PROCESSOR SPEED VARIABLE USED
1444                                            ;TO ALTER THE WAIT VARIABLES.
1445  002226                                    ENDSW
1446  002226                                                                    L10001:
1447
1448
1449
1450
1451
```

```
                                .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
```

```
1508    000100          PRI02== 100
1509    000040          PRI01== 40
1510    000000          PRI00== 0
1511                    ;
1512                    ;OPERATOR FLAG BITS
1513                    ;
1514    000004          EVL==     4
1515    000010          LOT==    10
1516    000020          ADR==    20
1517    000040          IDU==    40
1518    000100          ISR==   100
1519    000200          UAM==   200
1520    000400          BOE==   400
1521    001000          PNT==  1000
1522    002000          PRI==  2000
1523    004000          IXE==  4000
1524    010000          IBE== 10000
1525    020000          IER== 20000
1526    040000          LOE== 40000
1527    100000          HOE== 100000
1528                    ;;**********************************************************************
1529
1530                    ;;**********************************************************************
1531                    ;SWITCH REGISTER OPTIONS
1532
1533    100000          SW15=   100000
1534    040000          SW14=   40000
1535    020000          SW13=   20000
1536    010000          SW12=   10000
1537    004000          SW11=   4000
1538    002000          SW10=   2000
1539    001000          SW09=   1000
1540    000400          SW08=   400
1541    000200          SW07=   200
1542    000100          SW06=   100
1543    000040          SW05=   40
1544    000020          SW04=   20
1545    000010          SW03=   10
1546    000004          SW02=   4
1547    000002          SW01=   2
1548    000001          SW00=   1
1549
1550                    ;;**********************************************************************
1551                    ;;CSR AND STAUS WORD DEFINITIONS
1552                    ;;SEL0 (CSR) - BSEL0/BSEL1
1553    100000          RUN=    BIT15           ;SET IF RUNNING
1554    040000          MCLR=   BIT14           ;MASTER CLEAR OF PROCESSOR AND LINE UNIT
1555    020000          MDIAG=  BIT13           ;CSR MAINTENANCE - ENABLE MICRODIAGNOSTICS
1556    010000          STLU=   BIT12           ;CSR MAINTENANCE - STEP LINE UNIT
1557    004000          LPLU=   BIT11           ;CSR MAINTENANCE - LINE UNIT LOOP
1558    002000          ROMO=   BIT10           ;CSR MAINTENANCE
1559    001000          ROMI=   BIT9            ;CSR MAINTENANCE
1560    000400          STUP=   BIT8            ;CSR MAINTENANCE - USED WITH LOOP LU
1561                                            ;WHEN ASSERTED, XMITTER SHIFTS; CLEAR, REC. SHIFTS
1562    000200          RDI-    BIT7            ;CSR - DMR11 READY RESPONSE
1563    000100          IESET=  BIT6            ;CSR - INTERRUPT ENABLE INPUT - DMR11 INTERRUPTS
```

```
1564                                                    ;CPU WHEN RDI SET IN RESPONSE TO RQI BEING SET.
1565            000040          RQI=    BIT5            ;CSR - REQUEST IN
1566            000020          IECLR=  BIT4            ;CSR - INTERRUPT ENABLE INPUT - DMR11 INTERRUPTS
1567                                                    ;CPU WHEN RDI CLEARS IN RESPONSE TO RQI BEING CLEAR.
1568                                                    ;(DMR RUN MODE ONLY)
1569            000004          RCV=    BIT2            ;CSR -  IF 0, TRANSMIT   &   IF 1, RECEIVE
1570
1571                            ;;SEL2 - BSEL2/BSEL3
1572            000200          RDO=    BIT7            ;SEL2 - DMR11 SETS TO INDICATE DATA READY FOR OUTPUT
1573            000100          IEO=    BIT6            ;SEL2 - SET TO ENABLE DMR11 TO INTERRUPT WHEN RDO
1574
1575                            ;;SEL6 - BSEL6/BSEL7
1576            020000          BASEUP= BIT13           ;SEL6 - CONTROL OUT - RESPONSE TO DMR MODE BASE
1577                                                    ;       TABLE UPDATE COMMAND.
1578            010000          RES=    BIT12           ;SEL6 - BASE IN -- WHEN SET CAUSES
1579                                                    ;       RESUMPTION OF OPERATION
1580            010000          CTS=    BIT12           ;SEL6 - CONTROL OUT - CTS FAILED
1581            004000          SECN=   BIT11           ;SEL6 - CONTROL IN -- START TIME (3 SEC IF SET
1582                                                    ;       1 SEC IF CLEAR)
1583            002000          HDX=    BIT10           ;SEL6 - HALF-DUPLEX  &  CLEAR FOR FULL-DUPLEX
1584            002000          CD=     BIT10           ;SEL6 - CONTROL OUT - CD GLITCHED
1585            001000          HALTC=  BIT9            ;SEL6 - EXTENDED CONTROL OUT - HALT COMPLETED
1586            000400          MAINT=  BIT8            ;SEL6 - DDCMP MAINTENANCE DURING CONTROL IN
1587            000522          DMR=    BIT8.122        ;SEL6 - BASE IN -- SET FOR DMR11 MODE
1588                                                    ;       122 IS THE DMR PASSWORD FOR BSEL6 AND
1589                                                    ;       BIT8 SETS THE DMR MODE BIT IN BSEL7
1590            000400          NXM=    BIT8            ;SEL6 - CONTROL OUT - NON EXISTENT MEMORY
1591            000200          STREC=  BIT7            ;SEL6 - CONTROL OUT - START RECEIVED
1592            000100          DISCON= BIT6            ;SEL6 - CONTROL OUT - DISCONNECT
1593            000100          DTR=    BIT6            ;SEL6 - MODEM WRITE - DATA TERMINAL READY
1594            000040          DMRRUN= BIT5            ;SEL6 - CONTROL OUT - DMR RUN MODE
1595            000020          TOLONG= BIT4            ;SEL6 - CONTROL OUT - MESSAGE TOO LONG
1596            000010          MAINT1= BIT3            ;SEL6 - MODEM WRITE - LOCAL MODEM LOOPBACK
1597            000010          MNTREC= BIT3            ;SEL6 - CONTROL OUT - MAINTENANCE MSG. RECEIVED
1598            000004          NOBFR=  BIT2            ;SEL6 - CONTROL OUT - NO BUFFER
1599            000004          MAINT2= BIT2            ;SEL6 - MODEM WRITE - REMOTE MODEM LOOPBACK
1600            000002          TOUT=   BIT1            ;SEL6 - CONTROL OUT - TIME OUT
1601            000001          NAKS=   BIT0            ;SEL6 - CONTROL OUT - NAKS THRESHOLD EXCEEDED
1602
1603
1604                            ;;**************************************************************************
1605                            ;;DDCMP COMMANDS - BITS 0 & 1 IN SEL0 AND SEL2
1606
1607                            ;INPUT (SEL0)
1608            000000          BACCT=  0               ;BUF ADDRESS AND CHARACTER COUNT TRANSMIT
1609            000001          CNTRL=  1               ;CONTROL COMMAND (IN OR OUT)
1610            000002          HLT=    2               ;HALT COMMAND
1611            000003          BASEI=  3               ;BASE IN COMMAND
1612            000004          BACCR=  4               ;BUF ADDRESS AND CHARACTER COUNT RECEIVE
1613            000005          WMODEM= 5               ;WRITE MODEM STATUS REGISTER
1614            000006          EXERR=  6               ;ENABLE EXTENDED ERROR NOTIFICATION
1615            000007          DXERR=  7               ;DISABLE EXTENDED ERROR NOTIFICATION
1616            000010          DDMC=   10              ;DESELECT DMC LINE MODE
1617            000011          UPDATE= 11              ;REQUEST BASE TABLE UPDATE
1618            000012          TIMER=  12              ;SET REP/SELECT TIMER VALUE
1619            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
```

```
1722                                                    ;MMANAG=1, MEMORY MANAGED BUFFERS USED
1723
1724  002304  000000                AX3:    .WORD   0     ;BIT PATTERN TO WRITE INTO AX3-15, WHEN
1725                                                    ;IT IS REQUESTED TO ALLOW INTERFACE
1726                                                    ;SELECTION. (TEST CONFIGURATION 1-4)
1727                                                    ;BIT0 = TEST BIT (MUST BE SET TO ALLOW SELECT)
1728                                                    ;BIT3 - INTEGRAL MODEM
1729                                                    ;BIT4 = V.35
1730                                                    ;BIT6 = EIA
1731                                                    ;BIT7 = RS422
1732  002306  000000                WMAINT: .WORD   0     ;FLAG SET WHEN IT IS NECESSARY TO WRITE
1733                                                    ;MODEM MAINTENANCE BITS (MAINTENANCE 1 & 2)
1734                                                    ;THIS FLAG IS SET OR CLEARED IN THE INIT CODE.
1735  002310  000000                MANUF:  .WORD   0     ;******* MANUFACTURING USE ONLY *******
1736                                                    ;THIS WORD MAY BE PATCHED TO A NON ZERO WHEN
1737                                                    ;MANUFACTURING SPECIAL TEST CONNECTORS ARE
1738                                                    ;USED.  THIS WILL ALLOW MAINTENANCE BITS
1739                                                    ;TO BE SET.
1740
1741
1742                                    ;;**************************************************************************
1743                                    ;PROGRAM VARIABLES
1744                                                    ;WORD1-WORD3 VALUES DETERMINED IN INIT
1745                                                    ;CODE DEPENDING ON THE BAUD RATE.
1746  002312  000000                WAIT1:  .WORD   0     ;VALUE FOR TIMEOUT COUNTER
1747                                                    ;USED IN $WAIT SUBROUTINE
1748  002314  000000                WAIT2:  .WORD   0     ;VALUE FOR TIMEOUT COUNTER USED IN $MSCLR
1749                                                    ;AND $CLRQI SUBROUTINES.
1750  002316  000000                WAIT3:  .WORD   0     ;VALUE FOR TIMEOUT COUNTER USED IN $INOUT.
1751  002320  000000                WAIT4:  .WORD   0     ;WORD USED AS OUTER LOOP COUNTER IN $INOUT.
1752  002322  000000                BUFSIZ: .WORD   0     ;CALCULATED BUFFER SIZE IN BYTES.
1753  002324  000000                BUFNUM: .WORD   0     ;# OF RECEIVE & TRANSMIT BUFFERS.  THIS
1754                                                    ;VARIABLE IS USED IN THE SUBROUTINE $BUFFS
1755
1756  002326  000000                INRCV:  .WORD   0     ;COUNTER FOR # OF BA/CC IN RECEIVES.
1757  002330  000000                INXMIT: .WORD   0     ;COUNTER FOR # OF BA/CC IN TRANSMITS.
1758  002332  000000                OUTRCV: .WORD   0     ;COUNTER FOR # OF BA/CC OUT RECEIVES.
1759  002334  000000                OUTXMT: .WORD   0     ;COUNTER FOR # OF BA/CC OUT TRANSMITS.
1760
1761                                    ;;**************************************************************************
1762                                    ;* MISCELLANEOUS STORAGE
1763  002336  000000                TEMP1:  .WORD   0     ;STORAGE FOR TURNAROUND TYPE
1764  002340  000000                TEMP:   .WORD   0     ;SCRATCH WORD USED FOR MISC. STORAGE IN SUB.
1765  002342  000000                SAVE:   .WORD   0     ;SCRATCH WORD USED FOR MISC. STORAGE IN SUB.
1766  002344  000000                FLAG:   .WORD   0     ;SCRATCH WORD USED FOR MISC. FLAG IN SUB.
1767  002346  000000                SFLAG:  .WORD   0     ;FLAG USED IN TEST 15 FOR LOOP CONTROL.
1768  002350  000000                SKIP:   .WORD   0     ;FLAG USED IN TEST 7 TO MARK WHETHER TO SKIP
1769                                                    ;A PORTION OF THE TEST.
1770  002352  000000                NXMFLG: .WORD   0     ;FLAG USED TO MARK THAT THE DMR ADDRESS IS NXM
1771
1772  002354  000000                INFLAG: .WORD   0     ;FLAG USED IN INISR TO FLAG WHEN ALL THE
1773                                                    ;BA/CC INS HAVE BEEN DONE.
1774
1775  002356  000000                OUTFLG: .WORD   0     ;FLAG USED IN OUTISR TO FLAG WHEN ALL THE
1776                                                    ;BA/CC OUTS HAVE BEEN DONE.
1777  002360  000000                RESFLG: .WORD   0     ;FLAG USED IN IN ISR TO FLAG THAT THE RESUME
```

```
1778
1779  002362  000000                    ERRFLG: .WORD   0               ;COMMAND HAS JUST BEEN ISSUED.
1780                                                                    ;FLAG USED IN THE WAIT SUBROUTINES ($WAIT
1781                                                                    ; & $CLRQI) TO RETURN ERROR CONDITON (SEC)
1782
1783  002364  000000                    LAST:   .WORD   0               ;WORD USED TO STORE LAST COMMAND PROCESSED IN
1784                                                                    ;THE INPUT INTERRUPT ROUTINE.
1785  002366  000000                    ERROR:  .WORD   0               ;ERROR STORAGE
1786  002370  000000                    LOGDEV: .WORD   0               ;LOGICAL DEVICE NUMBER
1787  002372  000000                    PSTACK: .WORD   0               ;CONTAINS BASE LEVEL PROGRAM SP
1788  002374  000000                    SUBRPC: .WORD   0               ;PC OF SUBR CALL FOR ERROR REPORTS
1789  002376  000000                    NESTPC: .WORD   0               ;FLAG TO NOTIFY WHEN A SUBR IS NESTED
1790                                                                    ;IN ANOTHER SUBROUTINE (WHEN SET)
1791  002400  000000                    CLRNO:  .WORD   0               ;THIS WORD IS INCREMENTED DURING EACH MASTER
1792                                                                    ;CLEAR.  THIS WILL ALLOW EVERY OTHER MASTER
1793                                                                    ;CLEAR TO RUN THE MICRO TESTS.
1794
1795                                                                    ;ROM CHECK VARAIBLES
1796  002402  000000                    LOCRC:  .WORD   0               ;CRC STORAGE FOR LOW BYTE CHIP
1797  002404  000000                    HICRC:  .WORD   0               ;CRC STORAGE FOR HIGH BYTE CHIP
1798  002406  000000                    LOWORD: .WORD   0               ;TEMP. WORD CONTAINING 2 CONSECUTIVE LOW BYTES
1799  002410  000000                    HIWORD: .WORD   0               ;TEMP. WORD CONTAINING 2 CONSECUTIVE HI BYTES
1800  002412  000000                    ROMADR: .WORD   0               ;POINTER TO ROM ADDRESS.
1801  002414  000000                    CHIPNO: .WORD   0               ;CHIP NUMBER BEING CHECKED.
1802  002416  000000                    COUNT:  .WORD   0               ;COUNTER USED IN THE $WAIT SUBROUTINE.
1803                                            .EVEN
1804
1805                                    ;;**************************************************************************
1806                                    ;;**************************************************************************
1807                                    ;;BUFFER AREA
1808                                            ;       ** CCITT PSUEDO-RANDOM TEST PATTERN **
1809                                            ; THE FOLLOWING 32 WORDS TRANSLATE INTO A 512 BIT PATTERN
1810                                            ; THAT WAS GENERATED ACCORDING TO CCITT RECOMMENDATION V.52.  THIS
1811                                            ; PATTERN WAS GENERATED BY A 9 BIT SHIFT REGISTER (INITIALIZED
1812                                            ; AS 1S) WHOSE 5TH AND 9TH BITS ARE XORED.  THIS XOR RESULT IS SHIFTED
1813                                            ; INTO THE 1ST BIT OF THE REGISTER AS THE REGISTER IS SHIFTED RIGHT.
1814                                            ; THE 9TH BIT (OR BIT SHIFTED OUT) IS SHIFTED INTO THE BIT PATTERN.
1815                                            ; NOTE: CCITT RECOMMENDED 511 BITS, I'VE EXTENDED THIS BY 1 BIT TO END
1816                                            ; ON A WORD BOUNDARY.
1817  002420                            $CCITT:
1818  002420  177603  157427  031011            .WORD   177603,157427,031011
1819  002426  047321  163715  105221            .WORD   047321,163715,105221
1820  002434  143325  142304  040041            .WORD   143325,142304,040041
1821  002442  014116  052606  172334            .WORD   014116,052606,172334
1822  002450  105025  123754  111337            .WORD   105025,123754,111337
1823  002456  111523  030030  145064            .WORD   111523,030030,145064
1824  002464  137642  143531  063617            .WORD   137642,143531,063617
1825  002472  135015  066730  026575            .WORD   135015,066730,026575
1826  002500  052012  053627  070071            .WORD   052012,053627,070071
1827  002506  151172  165044  031605            .WORD   151172,165044,031605
1828  002514  166632  016741                    .WORD   166632,016741
1829
1830                                    ;;**************************************************************************
1831                                    ;; TRANSMIT BUFFER (SMALL)
1832
1833  002520  000000                    TFLAG:  .WORD   0               ;FLAG FOR STATUS OF TRANSMIT BUFFER
```

```
1834            000044                          TCOUNT= 36.                     ;CHARACTER COUNT OF TBUF
1835  002522    041101  042103  043105          TBUF:   .ASCIZ  /ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789/
1836  002530    044107  045111  046113
1837  002536    047115  050117  051121
1838  002544    052123  053125  054127
1839  002552    055131  030460  031462
1840  002560    032464  033466  034470
1841  002566      000
1842            002570                                  .EVEN
1843
1844
1845                                            ;;**********************************************************************
1846                                            ;; RECEIVE BUFFER (SMALL)
1847
1848  002570    000000                          RFLAG:  .WORD   0               ;FLAG FOR STATUS OF RECEIVE BUFFER
1849            000044                          RCOUNT= 36.                     ;CHARACTER COUNT OF RBUF
1850  002572    000046                          RBUF:   .BLKB   38.             ;36. BYTE BUFFER + 2 BYTES USED
1851                                                                            ;TO MARK THE END OF THE RECEIVE BUFFER
1852                                                    .EVEN
1853
1854                                            ;;**********************************************************************
1855                                            ;; BASE TABLE
1856
1857  002640    000400                          BASE:   .BLKB   256.            ;MICROPROCESSOR MEMORY ALLOCATION
1858
1859                                            ;;**********************************************************************
1860                                            ;; TRANSMIT AND RECEIVE BUFFER POINTERS
1861
1862  003240    000200                          XMTBUF: .BLKW   128.            ;POINTERS TO TRANSMIT BUFFERS (UP TO 64)
1863                                                                            ;1 WORD FOR ADDRESS AND 1 WORD FOR CHAR. COUNT
1864  003640    000200                          RCVBUF: .BLKW   128.            ;POINTERS TO RECEIVE BUFFERS (UP TO 64).
1865
1866                                            ;;**********************************************************************
1867                                            ;; BUFFER AREA (LARGE)
1868
1869  004240    004000                          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
                                    ;;*************************************************************************
010240                                      DEVTYP  <DMR11>
010240                                                                      L$DVTYP::
010240  046504  030522  000061                                                      .ASCIZ  /DMR11/
                                                                                    .EVEN

                                    ;;***************************************************************************
                                    ;* TITLE OF PROGRAM
                                    ;;***************************************************************************
010246                                      DESCRIPT   <DMR-11 FUNCTIONAL TESTS>
010246                                                                      L$DESC::
010246  046504  026522  030461                                                      .ASCIZ  /DMR-11 FUNCTION
010254  043040  047125  052103
010262  047511  040516  020114
010270  042524  052123  000123
                                                                                    .EVEN




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

```
1909                            .SBTTL  GLOBAL SUBROUTINES
1910
1911                            ;////////////////////////////////////////////////////////////////////////////
1912                            ;/      THE GLOBAL SUBROUTINES ARE CALLED BY MORE THAN ONE TEST
1913                            ;////////////////////////////////////////////////////////////////////////////
1914
1915
1916                            ;;*************************************************************************
1917                            ;
1918                            ;       MACROS - THERE ARE 2 BASIC TYPES OF MACROS USED
1919                            ;                       1. NORMAL MACROS -
1920                            ;                       2. DMR11 FUNCTIONAL MACROS - THESE MACROS MAY
1921                            ;                          BE NOTHING MORE THAN A CALL TO A SUBROUTINE,
1922                            ;                          BUT THEY ARE DISTINCT DMR FUNCTIONS WHICH CAN
1923                            ;                          DISTINGUISHED BY THE IN-LINE MACRO NAME.
1924                            ;
1925                            ;;*************************************************************************
1926
1927                            ;;*************************************************************************
1928                            ; CALL MACRO - CALL ROUTINE = JSR PC, ROUTINE
1929                            ;               (NOTE: RETURN IS  EQUATED TO A RTS PC)
1930                            ;;*************************************************************************
1931
1932                                    .MACRO  CALL    ROUTIN
1933                                    .IF     B, ROUTIN
1934                                    .ERROR  ROUTINE; ## MISSING ROUTINE-EXPANSION ARORT ##
1935                                    .MEXIT
1936                                    .ENDC
1937                                    JSR     PC,ROUTIN
1938                                    .ENDM
1939
1940                            ;;*************************************************************************
1941                            ; WAIT $FLAG MACRO - THIS MACRO INTERPUTS THE $FLAG AS RDI, RQI OR RDO.
1942                            ;                    IF RDI OR RDO, THE SUBROUTINE CALLED WILL WAIT UNTIL
1943                            ;                    THE RESPECTIVE BIT IS SET.  IF RQI, THE SUBROUTINE
1944                            ;                    CALLED WILL CLEAR RQI AND WAIT UNTIL RDI IS CLEARED.
1945                            ;;*************************************************************************
1946
1947                                    .MACRO  WAIT    $FLAG
1948                                    .NLIST
1949                                    .LIST ME
1950                                    .LIST
1951                                                            ;**** MACRO EXPANSION ****
1952                                    .IF     B, $FLAG
1953                                    .ERROR  FLAG    ;## MISSING FLAG FOR WAIT - EXPANSION ABORT ##
1954                                    .MEXIT
1955                                    .ENDC
1956                                    .IF     IDN $FLAG,RQI
1957                                    JSR     PC, $CLRQI      ;CLEAR RQI AND WAIT FOR IT TO BE CLEARED.
1958                                    .ENDC
1959                                    .IF     IDN $FLAG,RDI
1960                                    JSR     PC, $WAIT       ;CALL WAIT ROUTINE
1961                                            .WORD   0       ;FLAG THAT WE'RE WAITING FOR RDI
1962                                    .ENDC
1963                                    .IF     IDN $FLAG,RDO
1964                                    JSR     PC, $WAIT       ;CALL WAIT ROUTINE
```

```
1965                                    .WORD   1       ;FLAG THAT WE'RE WAITING FOR RDO
1966                            .ENDC
1967                                                    ;****                   ****
1968                            .NLIST ME
1969                            .ENDM
1970
1971
1972                    ;;**************************************************************************
1973                    ; CLEAR MACRO - THIS IS A DMR FUNCTIONAL MACRO WHICH CALLS THE
1974                    ;               $MSCLR SUBROUTINE
1975                    ;;**************************************************************************
1976                            .MACRO  CLEAR
1977                            .NLIST
1978                            .LIST ME
1979                            .LIST
1980                                                    ;**** MACRO EXPANSION ****
1981                            JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
1982                                                    ;****                   ****
1983                            .NLIST ME
1984                            .ENDM
1985
```

```
1986                    ;;*****************************************************************************
1987                    ; BASEIN MACRO - THIS IS A DMR FUNCTIONAL MACRO WHICH CALLS THE
1988                    ;                $BASEIN SUBROUTINE (WITH DEFAULT ARGUMENTS
1989                    ;                IF ARGUMENTS NOT GIVEN)
1990                    ;;*****************************************************************************
1991                            .MACRO  BASEIN  $A,$B,$C
1992                            .NLIST
1993                            .LIST ME
1994                            .LIST
1995                                                    ;**** MACRO EXPANSION ****
1996                            .IF     B       $A
1997                            JSR     PC, $BASEI      ;CALL BASE IN ROUTINE WITH DEFAULTS
1998                                    .WORD   LPLU    ;SET LINE UNIT LOOP
1999                                    .WORD   BASE    ;BASE TABLE ADDRESS
2000                                    .WORD   DMR     ;DMR-11 MODE
2001                            .IFF
2002                            JSR     PC, $BASEI      ;CALL BASE IN ROUTINE
2003                                    .WORD   $A      ;MAINTENANCE MODE BITS TO SET IN BSEL1
2004                                    .WORD   $B      ;BASE TABLE ADDRESS
2005                                    .WORD   $C      ;MODE
2006                            .ENDC
2007                                                    ;****                   ****
2008                            .NLIST ME
2009                            .ENDM
2010
2011
2012
2013
2014                    ;;*****************************************************************************
2015                    ; CNTRIN MACRO - THIS IS A DMR FUNCTIONAL MACRO WHICH CALLS THE
2016                    ;                $CNTIN SUBROUTINE (WITH DEFAULT ARGUMENTS
2017                    ;                IF ARGUMENTS NOT GIVEN)
2018                    ;;*****************************************************************************
2019                            .MACRO  CNTRIN  $A
2020                            .NLIST
2021                            .LIST ME
2022                            .LIST
2023                                                    ;**** MACRO EXPANSION ****
2024                            .IF     B       $A
2025                            JSR     PC, $CNTIN      ;CALL CONTROL IN ROUTINE WITH DEFAULT
2026                                    .WORD   0       ;SEL6 - FULL DUPLEX, RUN MODE,  SEC START.
2027                            .IFF
2028                            JSR     PC, $CNTIN      ;CALL CONTROL IN ROUTINE
2029                                    .WORD   $A      ;SEL6 - (DUPLEX, MODE)
2030                            .ENDC
2031                                                    ;****                   ****
2032                            .NLIST ME
2033                            .ENDM
2034
```

```
2035                    ;;*****************************************************************************
2036                    ; DMRIN MACRO -  THIS IS A DMR FUNCTIONAL MACRO WHICH CALLS THE
2037                    ;                $DMRIN SUBROUTINE
2038                    ;;*****************************************************************************
2039                            .MACRO  DMRIN   $A,$B,$C
2040                            .NLIST
2041                            .LIST ME
2042                            .LIST
2043                                                    ;**** MACRO EXPANSION ****
2044                            .IF     B       $A
2045                            .ERROR  DMRIN; ## MISSING ARGUMENTS-EXPANSION ABORT ##
2046                            .MEXIT
2047                            .ENDC
2048                            JSR     PC, $DMRIN      ;CALL DMR MODE INPUT ROUTINE
2049                                    .WORD   $A      ;INPUT COMMAND
2050                            .IF     B       $B
2051                                    .WORD   0       ;NO SEL4
2052                            .IFF
2053                                    .WORD   $B      ;SEL4 VALUE (OR BITS TO CLEAR IN BSEL6)
2054                            .ENDC
2055                            .IF     B       $C
2056                                    .WORD   0       ;NO SEL6
2057                            .IFF
2058                                    .WORD   $C      ;SEL6 VALUE (OR BITS TO SET IN BSEL6)
2059                            .ENDC
2060                                                    ;****                   ****
2061                            .NLIST ME
2062                            .ENDM
2063
2064
2065
2066
2067                    ;;*****************************************************************************
2068                    ; SHUTDN MACRO - THIS IS A DMR FUNCTIONAL MACRO WHICH CALLS THE
2069                    ;                $HALT SUBROUTINE
2070                    ;;*****************************************************************************
2071                            .MACRO  SHUTDN
2072                            .NLIST
2073                            .LIST ME
2074                            .LIST
2075                                                    ;**** MACRO EXPANSION ****
2076                            JSR     PC, $HALT       ;DMR HALT ROUTINE.
2077                                                    ;****                   ****
2078                            .NLIST ME
2079                            .ENDM
2080
```

```
2081                    ;;*****************************************************************************
2082                    ; BACCIR MACRO -  THIS IS A DMR FUNCTIONAL MACRO WHICH CALLS THE
2083                    ;                 $BACC SUBROUTINE (WITH DEFAULT ARGUMENTS
2084                    ;                 IF ARGUMENTS NOT GIVEN)
2085                    ;;*****************************************************************************
2086                            .MACRO  BACCIR  $A,$B
2087                            .NLIST
2088                            .LIST ME
2089                            .LIST
2090                                                    ;**** MACRO EXPANSION ****
2091                            .IF     B       $A
2092                            JSR     PC, $BACC       ;CALL BA/CC IN ROUTINE WITH DEFAULTS
2093                                    .WORD   RQI.BACCR       ;BA/CC IN RECEIVE COMMAND
2094                                    .WORD   RBUF    ;RECEIVE BUFFER
2095                                    .WORD   RCOUNT  ;RECEIVE CHARACTER COUNT
2096                            .IFF
2097                            JSR     PC, $BACC       ;CALL BA/CC IN ROUTINE
2098                                    .WORD   RQI!BACCR       ;BA/CC IN RECEIVE COMMAND
2099                                    .WORD   $A      ;BUFFER ADDRESS BITS 0-15
2100                                    .WORD   $B      ;BA BITS 16/17 AND CHAR. COUNT
2101                            .ENDC
2102                                                    ;****                   ****
2103                            .NLIST ME
2104                            .ENDM
2105
2106
2107                    ;;*****************************************************************************
2108                    ; BACCIT MACRO -  THIS IS A DMR FUNCTIONAL MACRO WHICH CALLS THE
2109                    ;                 $BACC SUBROUTINE (WITH DEFAULT ARGUMENTS
2110                    ;                 IF ARGUMENTS NOT GIVEN)
2111                    ;;*****************************************************************************
2112                            .MACRO  BACCIT  $A,$B
2113                            .NLIST
2114                            .LIST ME
2115                            .LIST
2116                                                    ;**** MACRO EXPANSION ****
2117                            .IF     B       $A
2118                            JSR     PC, $BACC       ;CALL BA/CC IN ROUTINE WITH DEFAULTS
2119                                    .WORD   RQI!BACCT       ;BA/CC IN TRANSMIT COMMAND
2120                                    .WORD   TBUF    ;TRANSMIT BUFFER ADDRESS
2121                                    .WORD   TCOUNT  ;TRANSMIT CHARACTER COUNT
2122                            .IFF
2123                            JSR     PC, $BACC       ;CALL BA/CC IN ROUTINE
2124                                    .WORD   RQI!BACCT       ;BA/CC IN TRANSMIT COMMAND
2125                                    .WORD   $A      ;BUFFER ADDRESS BITS 0-15
2126                                    .WORD   $B      ;BA BITS 16 & 17 AND CHAR. COUNT
2127                            .ENDC
2128                                                    ;****                   ****
2129                            .NLIST ME
2130                            .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
;
;*******************************************************************************
;*******************************************************************************
010276                          $WAIT:
010276  005037  002362                CLR     ERRFLG          ;CLEAR ERROR FLAG
010302  005037  002416                CLR     COUNT           ;CLEAR DELAY COUNTER
010306  005737  002376                TST     NESTPC          ;IS THIS NESTED IN ANOTHER SUBROUTINE?
010312  001005                        BNE     10$             ;YES - USE THE SUBRPC ALREADY CALCULATED.
010314  011637  002374                MOV     (SP),SUBRPC     ;SAVE PC AFTER THE CALL TO $WAIT.
010320  162737  000004  002374        SUB     #4,SUBRPC       ;BACKUP TO THE PC OF THE ACTUAL CALL
010326                          10$:
010326  017637  000000  002340        MOV     @(SP),TEMP      ;GET THE FLAG FOR RDI OR RDO
010334  062716  000002                ADD     #2,(SP)         ;INC THE PC LEFT ON THE STACK TO POINT
                                                                ;PAST THE FLAG ARGUMENT
010340  010046                        MOV     R0,-(SP)        ;SAVE R0
010342  010146                        MOV     R1,-(SP)        ;SAVE R1
010344  013701  002312                MOV     WAIT1,R1        ;DELAY COUNTER DETERMINED BY BAUD RATE
                                                                ;(DETERMINED IN INIT ROUTINE).
010350                          30$:
010350  005000                        CLR     R0              ;INNER LOOP COUNT OF DELAY COUNTER
010352                          40$:
010352  032777  000200  171654        BIT     #RDO,@SEL2      ;IS THE RDO BIT SET IN SEL2?
010360  001036                        BNE     60$             ;YES - EXIT BIT CHECK LOOP.
```

```
2187  010362  032777  000200  171642          BIT     #RDI,@SEL0      ;IS THE RDI BIT SET IN SEL0?
2188  010370  001064                          BNE     70$             ;YES - EXIT
2189  010372                                  BREAK                   ;CALL SUPERVISOR - ALLOW CONSOLE INTERRUPT.
2190  010372  104422                                                          TRAP    C$BRK
2191  010374  005237  002416                  INC     COUNT           ;INCREMENT DELAY COUNTER.
2192  010400  005300                          DEC     R0              ;LOOP UNTIL R0 RETURNS TO 0
2193  010402  001363                          BNE     40$
2194  010404                                  DELAY   1               ;DELAY 100 MICROSECONDS
2195  010404  012727  000001                                                  MOV     #1,(PC)+
2196  010410  000000                                                          .WORD   0
2197  010412  013727  002116                                                  MOV     L$DLY,(PC)+
2198  010416  000000                                                          .WORD   0
2199  010420  005367  177772                                                  DEC     -6(PC)
2200  010424  001375                                                          BNE     .-4
2201  010426  005367  177756                                                  DEC     -22(PC)
2202  010432  001367                                                          BNE     .-20
2203                                                  ;BETWEEN LOOPS.
2204  010434  005301                          DEC     R1              ;REPEAT UNTIL MAXIMUM LOOP SATISFIED.
2205  010436  001344                          BNE     30$
2206  010440                                  ERRDF   1,EMG1,ERRG2    ;TIME OUT ERROR
2207  010440  104455                                                          TRAP    C$ERDF
2208  010442  000001                                                          .WORD   1
2209  010444  017716                                                          .WORD   EMG1
2210  010446  015124                                                          .WORD   ERRG2
2211  010450  005237  002362                  INC     ERRFLG          ;SET ERROR FLAG
2212  010454  000445                          BR      100$            ;BRANCH TO COMMON EXIT.
2213  010456                          60$:
2214  010456  005737  002340                  TST     TEMP            ;WERE WE WAITING FOR THE RDO FLAG?
2215  010462  001042                          BNE     100$            ;YES - OK, EXIT.
2216  010464  022737  000001  002366          CMP     #CNTRL,ERROR    ;IS THIS CONTROL OUT ERROR EXPECTED?
2217  010472  001436                          BEQ     100$            ;IF YES, DON'T REPORT THE FOLLOWING ERRORS.
2218  010474                                  PRINTB #FMS1            ;RECEIVED AN RDO, WHEN WAITING FOR RDI
2219  010474  012746  010620                                                  MOV     #FMS1,-(SP)
2220  010500  012746  000001                                                  MOV     #1,-(SP)
2221  010504  010600                                                          MOV     SP,R0
2222  010506  104414                                                          TRAP    C$PNTB
2223  010510  062706  000004                                                  ADD     #4,SP
2224  010514  032777  000001  171512          BIT     #CNTRL,@SEL2    ;IS THIS A CONTROL OUT?
2225  010522  001422                          BEQ     100$            ;NO NEED TO CHECK ERROR CODES.
2226  010524                                  ERRDF   9,EMG9,ERRG2    ;UNEXPECTED CONTROL OUT.
2227  010524  104455                                                          TRAP    C$ERDF
2228  010526  000011                                                          .WORD   9
2229  010530  020040                                                          .WORD   EMG9
2230  010532  015124                                                          .WORD   ERRG2
2231  010534  005237  002362                  INC     ERRFLG          ;SET ERROR FLAG.
2232  010540  000413                          BR      100$
2233  010542                          70$:
2234  010542  005737  002340                  TST     TEMP            ;WERE WE WAITING FOR THE RDI FLAG?
2235  010546  001410                          BEQ     100$            ;YES - OK, EXIT
2236  010550                                  PRINTB  #FMS2           ;RECEIVED AN RDI, WHEN WAITING FOR RDO
2237  010550  012746  010653                                                  MOV     #FMS2,-(SP)
2238  010554  012746  000001                                                  MOV     #1,-(SP)
2239  010560  010600                                                          MOV     SP,R0
2240  010562  104414                                                          TRAP    C$PNTB
2241  010564  062706  000004                                                  ADD     #4,SP
2242  010570                          100$:
```

```
2243  010570  005737  002376              TST     NESTPC          ;WAS THIS NESTED IN ANOTHER SUBROUTINE?
2244  010574  001002                      BNE     105$            ;IF YES - LEAVE THE SUBROUTINE PC ALONE
2245  010576  005037  002374              CLR     SUBRPC          ;CLEAR THE PC
2246  010602                          105$:
2247  010602  012601                      MOV     (SP)+,R1        ;RESTORE R1
2248  010604  012600                      MOV     (SP)+,R0        ;RESTORE R0
2249  010606  005737  002362              TST     ERRFLG          ;WAS THERE AN ERROR (CARRY CLEARED ON TST)
2250  010612  001401                      BEQ     110$            ;IF NOT, RETURN WITH CARRY CLEAR
2251  010614  000261                      SEC                     ;SET CARRY.
2252  010616                          110$:
2253  010616  000207                      RETURN
2254
2255  010620  047045  040445  042122  FMS1:   .ASCIZ  /%N%ARDO SET EXPECTED RDI%N/
2256  010626  020117  042523  020124
2257  010634  054105  042520  052103
2258  010642  042105  051040  044504
2259  010650  047045     000
2260  010653     045  022516  051101  FMS2:   .ASCIZ  /%N%ARDI SET EXPECTED RDO%N/
2261  010660  044504  051440  052105
2262  010666  042440  050130  041505
2263  010674  042524  020104  042122
2264  010702  022517  000116
2265                                  .EVEN
2266
2267
```

```
;*******************************************************************************
;*******************************************************************************
;
;                          SUBROUTINE $CLRQI
;
;                 FUNCTION -  TO CLEAR RQI AND WAIT FOR RDI TO BE CLEARED
;
;       CALLING FORMAT:          JSR     PC,     $CLRQI
;                                (MACRO CALL -- WAIT RQI)
;
;       NESTING LEVEL    - MAY BE NESTED WITHIN ANOTHER SUBROUTINE
;
;       ENTRY CONDITIONS - WAIT2 = DELAY COUNTER (DETERMINED IN INIT. ROUTINE)
;                          NESTPC= 1   -   ROUTINE NESTED WITHIN ANOTHER
;                                          SUBROUTINE.
;                                = 0   -   ROUTINE NOT NESTED.
;
;        EXIT CONDITIONS - 1. NON ERROR, DMR READY TO RECEIVE THE NEXT COMMAND
;                          2. ERROR IF RDI DOES NOT CLEAR BEFORE THE
;                             DELAY ROUTINE EXPIRES. AN ERROR MESSAGE WILL
;                             OCCUR.  ALSO A CARRY BIT WILL BE SET TO FLAG
;                             THE ERROR FOR THE USER.
;
;    REGISTERS DESTROYED - RESTORED
;
;*******************************************************************************
;*******************************************************************************
$CLRQI:
        CLR     ERRFLG          ;CLEAR ERROR FLAG
        BIC     #RQI,@SEL0      ;REQUEST INPUT CLEAR
        TST     NESTPC          ;IS THIS NESTED IN ANOTHER SUBROUTINE?
        BNE     10$             ;YES - USE SUBRPC CALCULATED
        MOV     (SP),SUBRPC     ;SAVE THE PC AFTER THE CALL TO $WAIT.
        SUB     #4,SUBRPC       ;BACKUP TO THE PC OF THE ACTUAL CALL.
10$:
        MOV     R0,-(SP)        ;SAVE R0
        MOV     R1,-(SP)        ;SAVE R1
        MOV     WAIT2,R1        ;GET THE DELAY COUNTER (DETERMINED BY
                                ;BAUD RATE IN INIT ROUTINE)
12$:
        CLR     R0              ;INNER LOOP COUNT
20$:
        BIT     #RDI,@SEL0      ;IS THE RDI BIT CLEAR IN SEL0?
        BEQ     30$             ;YES - EXIT
        BREAK                   ;CALL SUPERVISOR - ALLOW CONSOLE INTERRUPT.
                                                        TRAP    C$BRK
        DEC     R0              ;LOOP UNTIL R0 RETURNS TO 0
        BNE     20$
        DELAY   1               ;DELAY 100 MICROSECONDS
                                                        MOV     #1,(PC)+
                                                        .WORD   0
                                                        MOV     L$DLY,(PC)+
                                                        .WORD   0
                                                        DEC     -6(PC)
                                                        BNE     .-4
```

```
2324  011012  005367  177756                                                          DEC     -22(PC)
2325  011016  001367                                                                  BNE     .-20
2326  011020  005301                  DEC     R1              ;REPEAT UNTIL MAXIMUM LOOP SATISFIED.
2327  011022  001352                  BNE     12$
2328  011024                          ERRDF   1,EMG1,ERRG2    ;TIME OUT ERROR
2329  011024  104455                                                                  TRAP    C$ERDF
2330  011026  000001                                                                  .WORD   1
2331  011030  017716                                                                  .WORD   EMG1
2332  011032  015124                                                                  .WORD   ERRG2
2333  011034  005237  002362          INC     ERRFLG          ;SET ERROR FLAG
2334  011040                  30$:
2335  011040  005737  002376          TST     NESTPC          ;WAS THIS A NESTED ROUTINE?
2336  011044  001002                  BNE     40$             ;IF YES - LEAVE THE SUBRPC ALONE
2337  011046  005037  002374          CLR     SUBRPC          ;CLEAR THE PC
2338  011052                  40$:
2339  011052  012601                  MOV     (SP)+,R1        ;RESTORE R1
2340  011054  012600                  MOV     (SP)+,R0        ;RESTORE R0
2341  011056  005737  002362          TST     ERRFLG          ;WAS THERE AN ERROR? (CARRY CLEARED ON TST)
2342  011062  001401                  BEQ     50$             ;IF NOT - RETURN WITH CARRY CLEAR
2343  011064  000261                  SEC                     ;SET CARRY.
2344  011066                  50$:
2345  011066  000207                  RETURN
2346
2347
```

```
;*****************************************************************************
;*****************************************************************************
;
;                          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 DEVELCOMENT USE ONLY.
;
;    REGISTERS DESTROYED - RESTORED
;
;*****************************************************************************
;*****************************************************************************
011070                  $MSCLR:
011070  011637  002374          MOV     (SP),SUBRPC     ;SAVE PC AFTER THE CALL TO $WAIT.
011074  162737  000004  002374  SUB     #4,SUBRPC       ;BACKUP TO THE PC OF THE ACTUAL CALL
011102  010046                  MOV     R0,-(SP)        ;SAVE R0
011104  010146                  MOV     R1,-(SP)        ;SAVE R1
011106  105077  171132          CLRB    @BSEL3          ;CLEAR BSEL3
011112  000240                  NOP                     ;**************************************
011114  000240                  NOP                     ;** PATCH AREA FOR 8206 IF NEEDED **
011116  000240                  NOP                     ;CLR @#SEL6  -
011120  000240                  NOP                     ;**************************************
011122  032737  000001  002400  BIT     #BIT0,CLRNO     ;IS THIS AN ODD MASTER CLEAR.
011130  001004                  BNE     7$              ;IF YES - BR
011132  012777  040000  171072  MOV     #MCLR,@SEL0     ;ISSUE A MASTER CLEAR.
011140  000403                  BR      8$
011142                  7$:
011142  012777  060000  171062  MOV     #MCLR!MDIAG,@SEL0 ;ISSUE THE MASTER CLEAR AND TOGGLE
                                                        ;MICRO TEST SWITCH.
011150                  8$:
```

```
2404  011150  000240                        NOP                     ;*************************************
2405  011152  000240                        NOP                     ;** PATCH AREA FOR 8206 IF NEEDED **
2406  011154  000240                        NOP                     ;MOV #RUN,@#SEL0  -
2407  011156  000240                        NOP                     ;*************************************
2408
2409  011160  005237  002400                INC     CLRNO           ;INCR WORD (CHANGE ODD TO EVEN ETC.)
2410  011164  013701  002314                MOV     WAIT2,R1        ;GET THE # OF 100 MICRO SECOND DELAYS
2411                                                                 ;TO WAIT BEFORE EXITING THE ROUTINE.
2412  011170                        10$:
2413  011170  005000                        CLR     R0              ;INNER LOOP COUNT
2414  011172                        20$:
2415  011172  032777  100000  171032        BIT     #RUN,@SEL0      ;IS THE RUN BIT SET IN SEL0?
2416  011200  001025                        BNE     40$             ;YES - EXIT
2417  011202                                BREAK                   ;CALL SUPERVISOR - ALLOW CONSOLE INTERRUPT.
2418  011202  104422                                                        TRAP    C$BRK
2419  011204  005300                        DEC     R0              ;LOOP UNTIL R0 RETURNS TO 0
2420  011206  001371                        BNE     20$
2421  011210                                DELAY   1               ;DELAY 100 MICROSECONDS
2422  011210  012727  000001                                                MOV     #1,(PC)+
2423  011214  000000                                                         .WORD   0
2424  011216  013727  002116                                                MOV     L$DLY,(PC)+
2425  011222  000000                                                         .WORD   0
2426  011224  005367  177772                                                DEC     -6(PC)
2427  011230  001375                                                        BNE     .-4
2428  011232  005367  177756                                                DEC     -22(PC)
2429  011236  001367                                                        BNE     .-20
2430  011240  005301                        DEC     R1              ;REPEAT UNTIL MAX LOOP SATISFIED.
2431  011242  001352                        BNE     10$
2432  011244                                ERRDF   1,EMG1,ERRG3    ;REPORT RUN NOT SET
2433  011244  104455                                                        TRAP    C$ERDF
2434  011246  000001                                                        .WORD   1
2435  011250  017716                                                        .WORD   EMG1
2436  011252  015240                                                        .WORD   ERRG3
2437  011254                        40$:
2438  011254  012601                        MOV     (SP)+,R1        ;RESTORE R1
2439  011256  012600                        MOV     (SP)+,R0        ;RESTORE R0
2440  011260  005037  002374                CLR     SUBRPC          ;TIDY UP SUBRPC
2441  011264  000207                        RETURN
2442
2443
```

```
                                        ;;**************************************************************
                                        ;;**************************************************************
                                        ;
                                        ;                       SUBROUTINE $BASEI
                                        ;
                                        ;               FUNCTION -  TO PERFORM A BASE IN COMMAND
                                        ;
                                        ;       CALLING FORMAT:         JSR     PC,     $BASEI
                                        ;                               .WORD A (SEL0 MAINTENANCE BITS)
                                        ;                               .WORD B (SEL4 - ADDRESS)
                                        ;                               .WORD C (SEL6 - MODE AND/OR RESUME)
                                        ;                               (MACRO CALL -- BASEIN  OR  BASEIN A,B,C)
                                        ;
                                        ;       NESTING LEVEL     - MAY ONLY BE CALLED FROM IN-LINE CODE (TEST,
                                        ;                           SUBTEST OR TEST SEGMENT)
                                        ;
                                        ;       ENTRY CONDITIONS - A = MAINTENANCE BITS (I.E. LINE UNIT LOOP BACK)
                                        ;                          B = BASE TABLE ADDRESS (SEL4)
                                        ;                          C = MODE + RESUME (SEL6)
                                        ;                          INFACE = 0  - NO INTERFACE WRITE REQUIRED
                                        ;                                   1  - WRITE INTERFACE (AX3-15)
                                        ;
                                        ;        EXIT CONDITIONS - 1. IF NO ERROR - DMR11 BASE TABLE ASSIGNED
                                        ;                          2. IF IN DMR MODE, AND INTERFACE WRITE REQUESTED
                                        ;                             WRITE REQUESTED AX3-15.
                                        ;                          3. TIMEOUT ERRORS ARE DETECTED IN WAIT SUBROUTINES.
                                        ;                          DMRFLG = -1  DMR MODE REQUESTED (USED IN CONTROL IN
                                        ;                                       ROUTINE)
                                        ;                                   0   DMC MODE OR RESUME REQUESTED.
                                        ;
                                        ;
                                        ;    REGISTERS DESTROYED - RESTORED
                                        ;
                                        ;;**************************************************************
                                        ;;**************************************************************
011266                                  $BASEI:
011266  011637  002374                          MOV     (SP),SUBRPC     ;SAVE PC AFTER THE CALL TO $WAIT.
011272  162737  000004  002374                  SUB     #4,SUBRPC       ;BACKUP TO THE PC OF THE ACTUAL CALL

011300  112777  000043  170724                  MOVB    #RQI!BASEI,@SEL0 ;ISSUE THE BASE IN COMMAND.
011306  012737  000001  002376                  MOV     #1,NESTPC       ;FLAG THAT THE NEXT SUBROUTINE IS NESTED.
011314                                          WAIT    RDI             ;WAIT FOR RDI
                                                                        ;**** MACRO EXPANSION ****
011314  004737  010276                          JSR     PC, $WAIT       ;CALL WAIT ROUTINE
011320  000000                                  .WORD   0               ;FLAG THAT WE'RE WAITING FOR RDI
                                                                        ;****                  ****
011322                                          BNERROR 10$             ;IF NO ERROR, RDI SET - PROCEED
011322  103003                                                                                  BCC     10$
011324  062716  000006                          ADD     #6,(SP)         ;CORRECT STACK FOR ERROR EXIT
011330  000467                                  BR      30$             ;EXIT
011332                                  10$:
011332  057677  000000  170672                  BIS     @(SP),@SEL0     ;SET ANY MAINTENANCE BITS
011340  062716  000002                          ADD     #2,(SP)         ;INC. POINTER.
011344  017677  000000  170664                  MOV     @(SP),@SEL4     ;SET UP BASE ADDRESS
011352  062716  000002                          ADD     #2,(SP)         ;INC. POINTER AGAIN
011356  017677  000000  170654                  MOV     @(SP),@SEL6     ;SET UP RESUME BIT AND THE HIGH 2 BITS
```

```
2500                                                    ;OF THE BASE TABLE ADDRESS
2501  011364  062716  000002            ADD     #2,(SP)         ;INC. POINTER AGAIN (SHOULD BE AT RETURN PC)
2502  011370                            WAIT    RQI             ;CLEAR RQI AND WAIT FOR RDI TO CLEAR
2503                                                    ;**** MACRO EXPANSION ****
2504  011370  004737  010706            JSR     PC, $CLRQI      ;CLEAR RQI AND WAIT FOR IT TO BE CLEARED.
2505                                                    ;****                ****
2506  011374                            BERROR  30$             ;IF ERROR, EXIT
2507  011374  103445                                                       BCS     30$
2508  011376  122777  000122  170634    CMPB    #122,@BSEL6     ;WAS THIS A DMR BASE IN?
2509  011404  001004                    BNE     15$             ;IF NOT, CLEAR DMR FLAG (DMC MODE)
2510  011406  032777  010000  170624    BIT     #RES,@SEL6      ;IS THIS A RESUME?
2511  011414  001403                    BEQ     16$             ;IF NOT, PROCEED
2512  011416                      15$:
2513  011416  005037  002260            CLR     DMRFLG          ;CLEAR DMR FLAG (NO DMR RUN ACKNOWLEDGE).
2514  011422  000432                    BR      30$             ;SKIP - TO END
2515  011424                      16$:
2516  011424  012737  177777  002260    MOV     #-1,DMRFLG      ;FLAG THAT DMR MODE WAS REQUESTED.
2517  011432  005737  002262            TST     INFACE          ;IS AN INTERFACE WRITE REQUIRED?
2518  011436  001424                    BEQ     30$             ;IF NOT - SKIP TO END
2519  011440  022737  000001  002366    CMP     #CNTRL,ERROR    ;ARE WE EXPECTING AN ERROR (IN TEST THAT
2520                                                    ;FORCES AN ERROR)
2521  011446  001004                    BNE     17$             ;IF NOT PROCEED
2522  011450  032777  000200  170554    BIT     #RDO,@SEL0      ;IF EXPECTING AN ERROR - IS RDO SET
2523  011456  001014                    BNE     30$             ;IF YES - DON'T BOTHER CHANGING THE INTERFACE.
2524  011460                      17$:
2525  011460  112777  000055  170544    MOVB    #RQI!INTER,@BSEL0 ;ISSUE WRITE INTERFACE COMMAND.
2526  011466                            WAIT    RDI             ;WAIT FOR RDI
2527                                                    ;**** MACRO EXPANSION ****
2528  011466  004737  010276            JSR     PC, $WAIT       ;CALL WAIT ROUTINE
2529  011472  000000                                    .WORD   0       ;FLAG THAT WE'RE WAITING FOR RDI
2530                                                    ;****                ****
2531  011474                            BERROR  30$             ;IF ERROR, BR TO END.
2532  011474  103405                                                       BCS     30$
2533  011476  113777  002304  170544    MOVB    AX3,@BSEL7      ;WRITE AX3-15. INTERFACE SELECTED
2534                                                    ;BY AX3 DETERMINED IN INIT. CODE.
2535  011504                            WAIT    RQI             ;CLEAR RQI AND WAIT FOR RDI TO CLEAR.
2536                                                    ;**** MACRO EXPANSION ****
2537  011504  004737  010706            JSR     PC, $CLRQI      ;CLEAR RQI AND WAIT FOR IT TO BE CLEARED.
2538                                                    ;****                ****
2539  011510                      30$:
2540  011510  005037  002376            CLR     NESTPC          ;CLEAR THE NEST FLAG
2541  011514  005037  002374            CLR     SUBRPC          ;TIDY UP SUBRPC
2542  011520  000207                    RETURN
2543
2544
```

```
2545                    ;;*****************************************************************************
2546                    ;;*****************************************************************************
2547                    ;
2548                    ;                       SUBROUTINE $CNTIN
2549                    ;
2550                    ;               FUNCTION -  TO PERFORM A CONTROL IN COMMAND
2551                    ;
2552                    ;       CALLING FORMAT:         JSR     PC,     $CNTIN
2553                    ;                               .WORD  A (SEL6 - MAINTENANCE MODE & HDX)
2554                    ;                               (MACRO CALL -- CNTRIN  OR  CNTRIN A)
2555                    ;
2556                    ;       NESTING LEVEL     - MAY ONLY BE CALLED FROM IN-LINE CODE (TEST,
2557                    ;                           SUBTEST OR TEST SEGMENT)
2558                    ;
2559                    ;       ENTRY CONDITIONS - DMRFLG = -1  EXPECT  CONTROL OUT IF IN DMR MODE
2560                    ;                                = 0  NO CONTROL OUT, IN DMC MODE OR RESUME.
2561                    ;
2562                    ;
2563                    ;        EXIT CONDITIONS - 1. IF NO ERROR - DMR11 CONTROL IN PERFORMED
2564                    ;                          2. TIMEOUTS REPORTED IN WAIT SUBROUTINES
2565                    ;                          3. IF THIS IS A DMR MODE START UP CONTROL IN,
2566                    ;                             THIS ROUTINE WILL WAIT FOR A CONTROL
2567                    ;                             OUT - DMR RUN.  IF THIS CONTROL OUT IS
2568                    ;                             NOT RECEIVED,  THIS WILL RESULT IN AN ERROR
2569                    ;                             MESSAGE AND A REMINDER TO CHECK THE BAUD RATE,
2570                    ;                             INTERFACE AND TURNAROUND (PROBABLE REASON).
2571                    ;
2572                    ;
2573                    ;
2574                    ;    REGISTERS DESTROYED
2575                    ;
2576                    ;;*****************************************************************************
2577                    ;;*****************************************************************************
2578  011522            $CNTIN:
2579  011522  011637  002374           MOV     (SP),SUBRPC     ;SAVE PC FROM WHERE THIS SUBR. WAS CALLED.
2580  011526  162737  000004  002374   SUB     #4,SUBRPC       ;BACKUP TO PC OF ACTUAL CALL
2581  011534  112777  000041  170470   MOVB    #RQI+CNTRL,@BSEL0 ;SET UP CONTROL IN COMMAND
2582  011542  012737  000001  002376   MOV     #1,NESTPC       ;FLAG THAT THE NEXT SUBROUTINE IS NESTED.
2583  011550                           WAIT    RDI             ;WAIT FOR SETTING OF RDI
2584                                                           ;**** MACRO EXPANSION ****
2585  011550  004737  010276           JSR     PC, $WAIT       ;CALL WAIT ROUTINE
2586  011554  000000                   .WORD   0               ;FLAG THAT WE'RE WAITING FOR RDI
2587                                                           ;****                    ****
2588  011556                           BNERROR 1$              ;IF NO ERROR - PROCEED
2589  011556  103003                                                                   BCC     1$
2590  011560  062716  000002           ADD     #2,(SP)         ;CORRECT RETURN ADDRESS
2591  011564  000463                   BR      20$             ;ERROR - EXIT
2592  011566                   1$:
2593  011566  017677  000000  170444   MOV     @(SP),@SEL6     ;SET MODE DESIRED
2594  011574  062716  000002           ADD     #2,(SP)         ;INC. RETURN PC LEFT ON STACK.
2595  011600  032777  000400  170432   BIT     #MAINT,@SEL6    ;WAS MAINTENANCE MODE REQUESTED?
2596  011606  001402                   BEQ     5$              ;IF NOT, LEAVE DMRFLG AS IS.
2597  011610  005037  002260           CLR     DMRFLG          ;CLEAR FLAG - NO RUN MODE CONTROL OUT.
2598  011614                   5$:
2599  011614                           WAIT    RQI             ;CLEAR RQI AND WAIT FOR RDI TO CLEAR
2600                                                           ;**** MACRO EXPANSION ****
```

```
2601  011614  004737  010706                  JSR     PC, $CLRQI      ;CLEAR RQI AND WAIT FOR IT TO BE CLEARED.
2602                                          ;****                   ****
2603  011620  005737  002260                  TST     DMRFLG          ;WAS DMR MODE REQUESTED ON BASE IN?
2604  011624  001443                          BEQ     20$             ;BR IF NOT (DMC MODE)
2605  011626  005037  002260                  CLR     DMRFLG          ;CLEAR DMR RUN MODE FLAG
2606  011632                                  WAIT    RDO             ;EXPECT RDO TO BE SET
2607                                          ;**** MACRO EXPANSION ****
2608  011632  004737  010276                  JSR     PC, $WAIT       ;CALL WAIT ROUTINE
2609  011636  000001                          .WORD   1               ;FLAG THAT WE'RE WAITING FOR RDO
2610                                          ;****                   ****
2611  011640                                  BNERROR 7$              ;IF NO ERROR - PROCEED
2612  011640  103011                                                                  BCC     7$
2613  011642                                  PRINTB  #FMS3           ;PRINT RUN ACKNOWLEDGE NOT RECEIVED.
2614  011642  012746  011746                                                          MOV     #FMS3,-(SP)
2615  011646  012746  000001                                                          MOV     #1,-(SP)
2616  011652  010600                                                                  MOV     SP,R0
2617  011654  104414                                                                  TRAP    C$PNTB
2618  011656  062706  000004                                                          ADD     #4,SP
2619  011662  000421                          BR      15$
2620  011664                          7$:
2621  011664  032777  000001  170342          BIT     #CNTRL,@SEL2    ;DID WE RECEIVE A CONTROL OUT?
2622  011672  001005                          BNE     10$             ;IF YES - PROCEED.
2623  011674                                  ERRDF   8,EMG8,ERRG2    ;EXPECTED CONTROL OUT NOT RECEIVED.
2624  011674  104455                                                                  TRAP    C$ERDF
2625  011676  000010                                                                  .WORD   8
2626  011700  017774                                                                  .WORD   EMG8
2627  011702  015124                                                                  .WORD   ERRG2
2628  011704  000410                          BR      15$
2629  011706                          10$:
2630  011706  032777  000040  170324          BIT     #DMRRUN,@SEL6   ;WAS THE DMR RUN MODE BIT SET?
2631  011714  001004                          BNE     15$             ;BR IF OK.
2632  011716                                  ERRDF   9,EMG9,ERRG2    ;WRONG CONTROL OUT RECEIVED.
2633  011716  104455                                                                  TRAP    C$ERDF
2634  011720  000011                                                                  .WORD   9
2635  011722  020040                                                                  .WORD   EMG9
2636  011724  015124                                                                  .WORD   ERRG2
2637
2638  011726                          15$:
2639  011726  042777  000207  170300          BIC     #RDO.CMD,@SEL2  ;CLEAR RDO AND THE COMMAND BITS
2640  011734                          20$:
2641  011734  005037  002376                  CLR     NESTPC          ;CLEAR THE NEST FLAG
2642  011740  005037  002374                  CLR     SUBRPC          ;CLEAR PC
2643  011744  000207                          RETURN
2644
2645  011746  040445  046504  020122  FMS3:   .ASCII  /%ADMR RUN ACKNOWLEDGE NOT RCVD.%N/
2646  011754  052522  020116  041501
2647  011762  047113  053517  042514
2648  011770  043504  020105  047516
2649  011776  020124  041522  042126
2650  012004  022456     116
2651  012007     045  024101  044103          .ASCIZ  /%A(CHECK INTERFACE, BAUD AND TURNAROUND)%N/
2652  012014  041505  020113  047111
2653  012022  042524  043122  041501
2654  012030  026105  041040  052501
2655  012036  020104  047101  020104
2656  012044  052524  047122  051101
```

```
2657  012052  052517  042116  02245'
2658  012060  000116
2659                                  .EVEN
2660
2661
```

```
;*****************************************************************************
;*****************************************************************************
;
;                          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
;
;*****************************************************************************
;*****************************************************************************
$DMRIN:
        TST     NESTPC          ;IS THIS SUBROUTINE NESTED?
        BNE     1$              ;IF YES - DON'T CHANGE  SUBRPC.
        MOV     (SP),SUBRPC     ;SAVE PC FROM WHERE THIS SUBR. WAS CALLED.
        SUB     #4,SUBRPC       ;BACKUP TO PC OF ACTUAL CALL
1$:
        MOVB    @(SP),SAVE      ;SAVE DMR INPUT COMMAND
        MOVB    @(SP),@BSEL0    ;SET UP DMR INPUT COMMAND.
        ADD     #2,(SP)         ;INC RETURN PC LEFT ON STACK.
        BIS     #RQI,@SEL0      ;REQUEST INPUT.
        MOV     NESTPC,-(SP)    ;SAVE THE CURRENT NEST FLAG.
        MOV     #1,NESTPC       ;USE THE FLAG TO SHOW THE WAIT
                                ;ROUTINE IS NESTED.
        WAIT    RDI             ;WAIT FOR SETTING OF RDI
                                ;**** MACRO EXPANSION ****
        JSR     PC, $WAIT       ;CALL WAIT ROUTINE
        .WORD   0               ;FLAG THAT WE'RE WAITING FOR RDI
                                ;****                    ****
        MOV     (SP)+,NESTPC    ;RESTORE THE ORIGINAL NEST FLAG.
        BNERROR 5$              ;IF NO ERROR, OK - PROCEED.
                                                        BCC     5$
        ADD     #4,(SP)         ;UPDATE RETURN ADDRESS.
```

```
2718  012162  000433                        BR      10$             ;ERROR EXIT.
2719  012164                          5$:
2720  012164  122737  000005  002342        CMPB    #WMODEM,SAVE    ;IS THIS A MODEM WRITE?
2721  012172  001413                        BEQ     6$              ;IF YES - SET/CLEAR BITS.
2722  012174  017677  000000  170034        MOV     @(SP),@SEL4     ;PASS VALUE FOR SEL4 (VALUE, IF ANY,
2723                                                                ;DEPENDS ON THE DMR COMMAND)
2724  012202  062716  000002                ADD     #2,(SP)         ;INC. RETURN PC LEFT ON STACK.
2725  012206  017677  000000  170024        MOV     @(SP),@SEL6     ;PASS VALUE FOR SEL6 (VALUE, IF ANY,
2726                                                                ;DEPENDS ON THE DMR COMMAND)
2727  012214  062716  000002                ADD     #2,(SP)         ;INC. RETURN PC LEFT ON STACK.
2728  012220  000412                        BR      7$
2729  012222                          6$:
2730  012222  047677  000000  170010        BIC     @(SP),@SEL6     ;CLEAR MODEM BITS
2731  012230  062716  000002                ADD     #2,(SP)         ;INC. RETURN PC LEFT ON STACK
2732  012234  057677  000000  167776        BIS     @(SP),@SEL6     ;SET MODEM BITS
2733  012242  062716  000002                ADD     #2,(SP)         ;INC. RETURN PC LEFT ON STACK.
2734  012246                          7$:
2735  012246                                  WAIT    RQI             ;CLEAR RQI AND WAIT FOR RDI TO CLEAR
2736                                                                  ;**** MACRO EXPANSION ****
2737  012246  004737  010706                  JSR     PC, $CLRQI      ;CLEAR RQI AND WAIT FOR IT TO BE CLEARED.
2738                                                                  ;****                    ****
2739  012252                          10$:
2740  012252  005737  002376                TST     NESTPC          ;WAS THIS ROUTINE NESTED?
2741  012256  001002                        BNE     15$             ;BR IF YES
2742  012260  005037  002374                CLR     SUBRPC          ;CLEAR PC
2743  012264                          15$:
2744  012264  005037  002342                CLR     SAVE            ;RESTORE TEMP VALUE
2745  012270  000207                        RETURN
2746
2747
2748
2749
```

```
                                          ;;*******************************************************************
                                          ;;*******************************************************************
                                          ;
                                          ;                          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
                                          ;
                                          ;;*******************************************************************
                                          ;;*******************************************************************
 012272                                   $BACC:
 012272  011637  002374                           MOV     (SP),SUBRPC      ;SAVE PC FROM WHERE THIS SUBR. WAS CALLED.
 012276  162737  000004  002374                   SUB     #4,SUBRPC        ;BACKUP TO PC OF ACTUAL CALL
 012304  117677  000000  167720                   MOVB    @(SP),@SEL0      ;SET UP BA/CC COMMAND IN (TRANSMIT OR RECEIVE)
 012312  062716  000002                           ADD     #2,(SP)          ;INC POINTER ON STACK
 012316  012737  000001  002376                   MOV     #1,NESTPC        ;FLAG THAT THE NEXT SUBROUTINE IS NESTED.
 012324                                           WAIT    RDI              ;WAIT FOR SETTING OF RDI
                                                                           ;**** MACRO EXPANSION ****
 012324  004737  010276                           JSR     PC, $WAIT        ;CALL WAIT ROUTINE
 012330  000000                                           .WORD   0        ;FLAG THAT WE'RE WAITING FOR RDI
                                                                           ;****                 ****
 012332                                           BNERROR 10$              ;IF NO ERROR - PROCEED
 012332  103003                                                                                       BCC      10$
 012334  062716  000004                           ADD     #4,(SP)          ;CORRECT STACK FOR ERROR EXIT.
 012340  000414                                   BR      20$              ;EXIT
 012342                                   10$:
 012342  017677  000000  167666                   MOV     @(SP),@SEL4      ;SET BUFFER ADDRESS
 012350  062716  000002                           ADD     #2,(SP)          ;INC POINTER ON STACK
 012354  017677  000000  167656                   MOV     @(SP),@SEL6      ;SET UP BUFFER COUNT AND BUFFER ADDRESS
                                                                           ;BITS 16 & 17
 012362  062716  000002                           ADD     #2,(SP)          ;INC POINTER ON STACK
 012366                                           WAIT    RQI              ;CLEAR RQI AND WAIT FOR RDI TO CLEAR
                                                                           ;**** MACRO EXPANSION ****
 012366  004737  010706                           JSR     PC, $CLRQI       ;CLEAR RQI AND WAIT FOR IT TO BE CLEARED.
                                                                           ;****                 ****
 012372                                   20$:
 012372  005037  002376                           CLR     NESTPC           ;CLEAR THE NEST FLAG
 012376  005037  002374                           CLR     SUBRPC           ;CLEAR PC
```

```
  2806  012402  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
;
;*****************************************************************************
;*****************************************************************************
$ERROR:
012404                          TST     NESTPC          ;IS THIS ROUTINE NESTED?
012404  005737  002376          BNE     10$             ;BR IF YES (PC ALREADY SAVED)
012410  001005                  MOV     (SP),SUBRPC     ;SAVE PC AFTER THE CALL TO $WAIT.
012412  011637  002374          SUB     #4,SUBRPC       ;BACKUP TO THE PC OF THE ACTUAL CALL
012416  162737  000004  002374  ;THE INSTRUCTION AFTER THE CALL.
012424                  10$:
012424  010046                  MOV     R0,-(SP)        ;SAVE R0
012426  010146                  MOV     R1,-(SP)        ;SAVE R1
012430  012700  002643          MOV     #BASE+3,R0      ;POINTER TO ACTUAL BASE TABLE COUNTS.
012434  012701  000006          MOV     #6.,R1          ;CHECK THE 6 NAK BYTES IN THE TABLE
012440                  20$:
012440  105720                  TSTB    (R0)+           ;IS THE NAK COUNT NON-ZERO?
012442  001022                  BNE     30$             ;IF YES - REPORT SOFT ERROR
012444  005301                  DEC     R1              ;LOOP UNTIL DONE.
012446  001374                  BNE     20$
012450  122010                  CMPB    (R0)+,(R0)      ;ARE THE REPS THE SAME?
012452  001016                  BNE     30$             ;IF NOT - REPORT ERROR.
012454  022737  000022  002114  CMP     #18.,L$TEST     ;IS THIS TEST 18 (LARGE BUFFER TEST)
012462  001407                  BEQ     25$             ;IF YES - ALLOW 1 REP
012464  022737  000016  002114  CMP     #14.,L$TEST     ;IS THIS TEST 14 ?
012472  001403                  BEQ     25$             ;IF YES - ALSO ALLOW 1 REP.
012474  105710                  TSTB    (R0)            ;IF NOT TEST 18 - REPORT IF NON ZERO.
012476  001004                  BNE     30$
012500  000407                  BR      40$             ;IF ZERO - OK.
012502                  25$:
012502  122710  000001          CMPB    #1,(R0)         ;IS THE REP 0 OR 1?
012506  002004                  BGE     40$             ;IF YES - OK (WE ALLOW 1 REP BECAUSE
                                                        ;IN TEST 18 AT LOW BAUD RATES 1 REP IS
                                                        ;EXPECTED.)
012510                  30$:
012510                          ERRSOFT 5,EMS3,ERRG4    ;REPORT SOFT ERROR
```

```
012510  104457                                                                                   TRAP    C$ERSOFT
012512  000005                                                                                   .WORD   5
012514  012540                                                                                   .WORD   EMS3
012516  015470                                                                                   .WORD   ERRG4
012520                                  40$:
012520  005737  002376                          TST     NESTPC          ;IS THE ROUTINE NESTED?
012524  001002                                  BNE     45$             ;BR IF YES
012526  005037  002374                          CLR     SUBRPC          ;CLEAR SAVED PC
012532                                  45$:
012532  012601                                  MOV     (SP)+,R1        ;RESTORE R1
012534  012600                                  MOV     (SP)+,R0        ;RESTORE R0
012536  000207                                  RETURN

012540  040502  042523  052040  EMS3:   .ASCIZ  /BASE TABLE ERRORS/
012546  041101  042514  042440
012554  051122  051117  000123
                                                .EVEN

```

```
2881                                    ;;*************************************************************************
2882                                    ;;*************************************************************************
2883                                    ;
2884                                    ;                       SUBROUTINE $HALT
2885                                    ;
2886                                    ;               FUNCTION - TO SHUTDOWN THE DMR11
2887                                    ;
2888                                    ;       ENTRY CONDITIONS - NONE
2889                                    ;
2890                                    ;       EXIT CONDITIONS  - DMR SHUTDOWN
2891                                    ;
2892                                    ;       REGISTERS        - NO EFFECT
2893                                    ;
2894                                    ;
2895                                    ;;*************************************************************************
2896                                    ;;*************************************************************************
2897  012562                            $HALT:
2898  012562  011637  002374                   MOV     (SP),SUBRPC     ;SAVE THE PC WHEN THE SUBROUTINE WAS CALLED.
2899  012566  162737  000004  002374           SUB     #4,SUBRPC       ;BACK UP TO THE ADDRESS OF THE ACTUAL CALL.
2900  012574  112777  000042  167430           MOVB    #RQI!HLT,@SEL0  ;ISSUE A HALT
2901  012602  105077  167426                   CLRB    @SEL2           ;CLEAR ANY OUTPUT PENDING
2902  012606  012737  000001  002376           MOV     #1,NESTPC       ;FLAG THAT THE NEXT SUBROUTINE IS NESTED.
2903  012614                                    WAIT    RDI             ;WAIT FOR RDI
2904                                                                    ;**** MACRO EXPANSION ****
2905  012614  004737  010276                   JSR     PC, $WAIT       ;CALL WAIT ROUTINE
2906  012620  000000                                    .WORD   0       ;FLAG THAT WE'RE WAITING FOR RDI
2907                                                                    ;****                   ****
2908  012622                                    BERROR  20$             ;IF ERROR, EXIT
2909  012622  103430                                                                           BCS     20$
2910  012624                                    WAIT    RQI             ;CLEAR RQI AND WAIT FOR RDI TO CLEAR
2911                                                                    ;**** MACRO EXPANSION ****
2912  012624  004737  010706                   JSR     PC, $CLRQI      ;CLEAR RQI AND WAIT FOR IT TO BE CLEARED.
2913                                                                    ;****                   ****
2914  012630                                    BERROR  20$             ;IF ERROR, EXIT
2915  012630  103425                                                                           BCS     20$
2916  012632                                    WAIT    RDO             ;WAIT FOR RDO
2917                                                                    ;**** MACRO EXPANSION ****
2918  012632  004737  010276                   JSR     PC, $WAIT       ;CALL WAIT ROUTINE
2919  012636  000001                                    .WORD   1       ;FLAG THAT WE'RE WAITING FOR RDO
2920                                                                    ;****                   ****
2921  012640                                    BERROR  20$             ;IF ERROR, EXIT
2922  012640  103421                                                                           BCS     20$
2923  012642  032777  000001  167364           BIT     #CNTRL,@SEL2    ;IS THIS A CONTROL OUT?
2924  012650  001005                           BNE     10$             ;IF YES - PROCEED
2925  012652                                    ERRDF   4,EMS4,ERRG2    ;ERROR
2926  012652  104455                                                                           TRAP    C$ERDF
2927  012654  000004                                                                           .WORD   4
2928  012656  012724                                                                           .WORD   EMS4
2929  012660  015124                                                                           .WORD   ERRG2
2930  012662  000410                           BR      20$
2931  012664                            10$:
2932  012664  032777  001000  167346           BIT     #HALTC,@SEL6    ;IS THE DMR HALTED?
2933  012672  001004                           BNE     20$             ;IF YES - EXIT
2934  012674                                    ERRDF   4,EMS4,ERRG2    ;ERROR - NOT EXPECTED CONTROL OUT.
2935  012674  104455                                                                           TRAP    C$FRDF
2936  012676  000004                                                                           .WORD   4
```

```
2937  012700  012724                                                                  .WORD   EMS4
2938  012702  015124                                                                  .WORD   ERRG2
2939  012704                        20$:
2940  012704  042777  000207  167322          BIC     #RDO!CMD,@SEL2  ;CLEAR RDO AND COMMAND BITS.
2941  012712  005037  002376                  CLR     NESTPC          ;CLEAR THE NEST FLAG
2942  012716  005037  002374                  CLR     SUBRPC          ;CLEAR THE PC.
2943  012722  000207                          RETURN
2944
2945  012724  044123  052125  047504  EMS4:   .ASCIZ  /SHUTDOWN ERROR/
2946  012732  047127  042440  051122
2947  012740  051117     000
2948          012744                          .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
                                        ;
                                        ;
                                        ;;*******************************************************************
                                        ;;*******************************************************************
012744                                  $ROMO:
012744  005077  167262                          CLR     @SEL0                   ;INIT
012750  113777  002413   67256                  MOVB    ROMADR+1,@SEL2          ;SET HIGH BYTE OF ROM ADDRESS
012756  052777  001000  167246                  BIS     #ROMI,@SEL0             ;ENABLE SEL6 TO BE USED AS MAINTENANCE REG.
012764  012777  121053  167246                  MOV     #121053,@SEL6           ;SET UP MICROINSTRUCTION TO
                                                                                ;MOVE IBUS* 2 TO OBUS* 13
                                                                                ;(OBUS* 13 IS A SHADOW REGISTER FOR
                                                                                ;BITS 8-11 OF THE PC)
012772  052777  000400  167232                  BIS     #STUP,@SEL0             ;CLOCK THE INSTRUCTION
013000  042777  001400  167224                  BIC     #ROMI!STUP,@SEL0        ;CLEAR
013006  042737  000377  013062                  BIC     #377,1$                 ;CLEAR ADDRESS FIELD OF BRANCH INST.
013014  153737  002412  013062                  BISB    ROMADR,1$               ;ADD ADDRESS OF BRANCH.
013022  052777  001000  167202                  BIS     #ROMI,@SEL0             ;ENABLE SEL6
013030  013777  013062  167202                  MOV     1$,@SEL6                ;SET UP MICROINSTRUCTION TO
                                                                                ;BRANCH IMMEDIATELY TO PC.  BRANCH IS
                                                                                ;NECESSARY TO TRANSFER PC SHADOW REG TO PC
013036  052777  000400  167166                  BIS     #STUP,@SEL0             ;CLOCK THE INSTRUCTION
                                                                                ;ROM PC = ROM ADDRESS
013044  042777  001400  167160                  BIC     #ROMI!STUP,@SEL0        ;CLEAR
013052  052777  002000  167152                  BIS     #ROMO,@SEL0             ;CLOCK IN A MAINTENANCE ROM OUT
                                                                                ;ROM CONTENTS ARE NOW IN SEL6.
013060  000207                                  RETURN

013062  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
;
;*****************************************************************************
;*****************************************************************************
$LOOP:
013064                          TST     DMCMDE          ;IS THE DMR IN DMC MODE?
013064  005737  002276          BNE     30$             ;IF SO, EXIT (CAN'T DO DMR MODE INPUT)
013070  001041                  TST     WMAINT          ;DO WE NEED TO WRITE THE MAINTENANCE BITS?
013072  005737  002306          BEQ     30$             ;IF NOT - EXIT.
013076  001436                  MOV     (SP),SUBRPC     ;SAVE THE PC AFTER THE CALL TO $LOOP
013100  011637  002374          SUB     #4,SUBRPC       ;BACKUP TO THE PC OF THE ACTUAL CALL.
013104  162737  000004  002374  CMP     #LLOOP,DMTURN   ;IS LOCAL MODEM LOOPBACK DESIRED?
013112  022737  000006  002254  BNE     10$             ;IF NOT - PROCEED.
013120  001007                  MOV     #MAINT2,100$    ;ENSURE REMOTE LOOPBACK IS CLEAR.
013122  012737  000004  013170  MOV     #MAINT1,101$    ;SET MAINT BIT FOR LOCAL LOOPBACK
013130  012737  000010  013172  BR      20$
013136  000406                  
013140                  10$:
                                                        ;IN ALL OTHER LOOPBACK CONFIGURATIONS
                                                        ;SET MAINTENANCE 2 (CONFIG. TYPE 1,3,7)
013140  012737  000010  013170  MOV     #MAINT1,100$    ;ENSURE REMOTE LOOPBACK IS CLEAR.
013146  012737  000004  013172  MOV     #MAINT2,101$    ;SET MAINT BIT FOR REMOTE LOOPBACK
013154                  20$:
013154  012737  000001  002376  MOV     #1,NESTPC       ;FLAG THAT THE NEXT SUBROUTINE IS NESTED.
013162                  CALL    $DMRIN          ;DMR MODE INPUT COMMAND
013166  000005                  .WORD   WMODEM   ;WRITE MODEM COMMAND
013170  000000          100$:   .WORD   0       ;BITS TO CLEAR IN MODEM REGISTER
013172  000000          101$:   .WORD   0       ;BITS TO SET IN MODEM REGISTER
013174                  30$:
013174  005037  002376          CLR     NESTPC          ;CLEAR THE NEST FLAG
013200  005037  002374          CLR     SUBRPC          ;CLEAR PC.
013204  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
                                        ;
                                        ;
                                        ;;*******************************************************************
                                        ;;*******************************************************************
013206                                  $BUFFS:
013206  011637  002374                          MOV     (SP),SUBRPC         ;SAVE PC AFTER THE CALL TO $BUFFS
013212  162737  000004  002374                  SUB     #4,SUBRPC           ;BACKUP TO THE PC OF THE CALL.
013220  005037  002352                          CLR     NXMFLG
013224                                          SETVEC  #4,#NOXMEM,#PRI07 ;SET UP TRAP 4 (WILL SET FLAG FOR NXM)
013224  012746  000340                                                                          MOV     #PRI07,-(SP)
013230  012746  023630                                                                          MOV     #NOXMEM,-(SP)
013234  012746  000004                                                                          MOV     #4,-(SP)
013240  012746  000003                                                                          MOV     #3,-(SP)
013244  104437                                                                                  TRAP    C$SVEC
013246  062706  000010                                                                          ADD     #10,SP
013252  005737  177572                          TST     @#177572            ;ADDRESS MEMORY MANAGEMENT REG
013256  005737  002352                          TST     NXMFLG              ;IS THE FLAG STILL CLEARED?
                                                                            ;NOTE: THE FLAG WILL BE SET BY THE TRAP
                                                                            ;IF THERE IS NO MEMORY MANAGEMENT.
013262  001143                                  BNE     30$                 ;BR TO USE NON-MEMORY MANAG. BUFFERS.
013264  023727  002120  003000                  CMP     L$HIMEM,#3000       ;IS THERE AT LEAST 48K WORDS? (16K WORDS
                                                                            ;FOR BUFFERS)
013272  002537                                  BLT     30$                 ;IF NOT, USE NON-MEMORY MANAG. BUFFERS.
013274  012737  000001  002302                  MOV     #1,MMANAG           ;FLAG THAT MEMORY MANAGEMENT IS USED
013302                                          SETPRI  #PRI07              ;MAKE SURE WE ARE IN KERNEL MODE.
013302  012700  000340                                                                          MOV     #PRI07,R0
013306  104441                                                                                  TRAP    C$SPRI
```

```
3096                                                    ;SETTING PRI SHOULD SHOULD ALSO CLEAR
3097                                                    ;BITS 14 & 15
3098  013310  012701  172300          MOV   #172300,R1  ;GET ADDRESS OF KERNEL PDR REG 0.
3099  013314  012700  000010          MOV   #8.,R0      ;WRITE PDR REG 0-7.
3100  013320                    10$:
3101  013320  012721  077406          MOV   #77406,(R1)+ ;WRITE BITS FOR THE FOLLOWING PAGE DESCRIPTION
3102                                                    ;READ/WRITE ACCESS, 128. BLOCK PAGE LENGTH.
3103  013324  005300                  DEC   R0          ;WRITE ALL PDRS.
3104  013326  001374                  BNE   10$
3105  013330  012701  172340          MOV   #172340,R1  ;ADDRESS OF KERNEL PAR 0
3106  013334  005011                  CLR   (R1)        ;PAR 0, ADDRS      0 -  17776
3107  013336  012761  000200  000002  MOV   #200,2(R1)  ;PAR 1, ADDRS  20000 -  37776
3108  013344  012761  000400  000004  MOV   #400,4(R1)  ;PAR 2, ADDRS  40000 -  57776
3109  013352  012761  002000  000006  MOV   #2000,6(R1) ;PAR 3, ADDRS 200000 - 217776 (BUFFER PAGE 1)
3110  013360  012761  002200  000010  MOV   #2200,10(R1) ;PAR 4, ADDRS 220000 - 237776 (BUFFER PAGE 2)
3111  013366  012761  002400  000012  MOV   #2400,12(R1) ;PAR 5, ADDRS 240000 - 257776 (BUFFER PAGE 3)
3112  013374  012761  002600  000014  MOV   #2600,14(R1) ;PAR 6, ADDRS 260000 - 277776 (BUFFER PAGE 4)
3113  013402  012761  007600  000016  MOV   #7600,16(R1) ;PAR 7, ADDRS 160000 - 677776 (I/O PAGE)
3114
3115  013410  012703  000400          MOV   #256.,R3    ;COUNTER FOR OUTER  LOOP OF TEST PATTERN
3116  013414  012704  060000          MOV   #60000,R4   ;USE VIRTUAL ADDRESS TO MAP TO PAR 5
3117                                                    ;GENERATE A TEST PATTERN IN THE 1ST 8K WORDS
3118                                                    ;VIRTUAL ADDRESS 60000 - 111776
3119  013420  012737  000001  177572  MOV   #1,@#177572 ;ENABLE MEMORY MANAGEMENT
3120  013426                    15$:
3121  013426  012701  000040          MOV   #32.,R1     ;COUNTER FOR INNER LOOP OF TEST PATTERN
3122  013432  012702  002420          MOV   #$CCITT,R2  ;ADDRESS FOR 32. WORD TEST PATTERN.
3123  013436                    16$:
3124  013436  012224                  MOV   (R2)+,(R4)+ ;WRITE TEST PATTERN
3125                                                    ;PHYSICAL ADDRESS 200000 - 237776
3126  013440  005737  002352          TST   NXMFLG      ;FLAG WILL BE SET IF WE ADDRESS NXM.
3127  013444  001050                  BNE   29$         ;IF NXM - DON'T USE MEMORY MANAGEMEN".
3128  013446  005301                  DEC   R1          ;DO TH INNER LOOP 32. TIMES
3129  013450  001372                  BNE   16$
3130  013452  005303                  DEC   R3          ;DO THE OUTER LOOP 256. TIMES
3131  013454  001364                  BNE   15$
3132  013456  012701  020000          MOV   #20000,R1   ;COUNTER TO CLEAR THE NEXT 8K WORDS
3133  013462                    17$:
3134  013462  005024                  CLR   (R4)+       ;CLEAR VIRTUAL ADDRESS 120000 - 157776
3135  013464  005737  002352          TST   NXMFLG      ;DOES AN NXM TRAP OCCUR?
3136  013470  001036                  BNE   29$         ;IF SO DON'T USE MEMORY MANAGEMENT.
3137  013472  005301                  DEC   R1
3138  013474  001372                  BNE   17$
3139  013476  005037  177572          CLR   @#177572    ;TURN OFF MEMORY MANAGEMENT
3140
3141  013502  012737  060000  003240  MOV   #60000,XMTBUF ;VIRTUAL ADDRESS OF XMIT BUFFER
3142  013510  012737  120000  003640  MOV   #120000,RCVBUF ;VIRTUAL ADDRESS OF RCV. BUFFER
3143  013516  022737  000001  002324  CMP   #1,BUFNUM    ;IS THERE ONLY 1 XMIT & RECEIVE BUFFER?
3144  013524  001004                  BNE   20$         ;IF NOT, BR
3145  013526  012737  037777  002322  MOV   #37777,BUFSIZ ;EACH BUFFER IS 16K BYTES
3146  013534  000525                  BR    60$
3147  013536                    20$:
3148  013536  022737  000007  002324  CMP   #7,BUFNUM    ;ARE THERE 7 XMIT & RECEIVE (14 TOTAL BUFFER)?
3149  013544  001004                  BNE   21$         ;IF NOT - MUST BE 64 BUFFERS
3150  013546  012737  004000  002322  MOV   #4000,BUFSIZ ;EACH BUFFER IS 2K BYTES
3151  013554  000515                  BR    60$
```

```
3152  013556                                21$:
3153  013556  012737  000376  002322              MOV     #376,BUFSIZ     ;EACH BUFFER IS 254. BYTES.
3154  013564  000511                              BR      60$
3155
3156  013566                                29$:
3157  013566  005037  177572                      CLR     @#177572        ;TURN OFF MEMORY MANAGEMENT
3158  013572                                30$:
3159  013572  005037  002302                      CLR     MMANAG          ;FLAG THAT MEMORY MANAGEMENT NOT USED.
3160  013576                                      CLRVEC  #4              ;RESTORE TRAP 4.
3161  013576  012700  000004                                                          MOV     #4,R0
3162  013602  104436                                                                 TRAP    C$CVEC
3163  013604                                      MEMORY  R2              ;FIND THE FREE MEMORY AVA'LABLE BETWEEN
3164  013604  104431                                                                 TRAP    C$MEM
3165  013606  010002                                                                 MOV     R0,R2
3166                                                                      ;THE DIAGNOSTIC AND THE DRS (SUPERVISOR).
3167  013610  021227  002000                      CMP     @R2,#2000       ;IS THERE AT LEAST 1K WORDS? (NOTE: CONTENTS
3168                                                                      ;OF THE RETURNED ADDRESS OF THE START OF FREE
3169                                                                      ;MEMORY CONTAIN THE AMOUNT OF AVAILABLE MEM.)
3170  013614  003406                              BLE     35$             ;IF NOT AT LEAST 1K, USE DEFAULT BUFFER.
3171  013616  010237  003240                      MOV     R2,XMTBUF       ;USE THE FREE MEMORY BUFFER.
3172  013622  011200                              MOV     @R2,R0          ;SAVE THE WORD SIZE OF THE BUFFER.
3173  013624  042700  000001                      BIC     #BIT0,R0        ;START WITH AN EVEN # OF WORDS.
3174  013630  000405                              BR      40$
3175  013632                                35$:
3176  013632  012737  004240  003240              MOV     #BIGBUF,XMTBUF  ;USE THE DEFAULT BUFFER (1ST HALF FOR XMIT).
3177  013640  012700  002000                      MOV     #2000,R0        ;1K WORD SIZE.
3178  013644                                40$:
3179  013644  013737  003240  003640              MOV     XMTBUF,RCVBUF   ;CALCULATE THE RECEIVE BUFFER ADDRESS
3180  013652  060037  003640                      ADD     R0,RCVBUF       ;AS STARTING IN THE 2ND HALF OF THE BUFFER.
3181  013656  010001                              MOV     R0,R1           ;BUFFER SIZE IN WORDS.
3182  013660  022737  000001  002324              CMP     #1,BUFNUM       ;ARE WE SETTING UP 1 RECEIVE AND XMIT BUFFER?
3183  013666  001415                              BEQ     47$             ;IF YES - R1 = BYTE SIZE FOR BOTH BUFFERS.
3184  013670  022737  000007  002324              CMP     #7,BUFNUM       ;ARE WE SETTING UP 7 RCV & 7 XMIT BUFFERS?
3185  013676  001004                              BNE     45$             ;IF NOT WE MUST NEED 64 RCV & 64 XMIT BUFFERS.
3186  013700  006201                              ASR     R1              ;R1 = # BYTES IN THE BUFFERS/8
3187  013702  006201                              ASR     R1
3188  013704  006201                              ASR     R1
3189  013706  000405                              BR      47$
3190  013710                                45$:
3191  013710  012704  000007                      MOV     #7,R4           ;DIVIDE BYTES BY 128.
3192  013714                                46$:
3193  013714  006201                              ASR     R1              ;SHIFT RIGHT 7 TIMES
3194  013716  005304                              DEC     R4
3195  013720  001375                              BNE     46$
3196  013722                                47$:
3197  013722  010137  002322                      MOV     R1,BUFSIZ       ;SAVE THE BUFFER SIZE IN BYTES.
3198  013726  162737  000002  002322              SUB     #2,BUFSIZ       ;ADJUST BUFFER SIZE BECAUSE WE
3199                                                                      ;WILL ADJUST BUFFER STARTING ADDRESS.
3200  013734  042737  000001  002322              BIC     #1,BUFSIZ       ;ENSURE WE START WITH AN EVEN # OF BYTES.
3201  013742  006200                              ASR     R0              ;# OF WORDS IN ALL XMIT BUFFERS.
3202  013744  010001                              MOV     R0,R1           ;SAVE # OF WORDS IN ALL RCV BUFFERS.
3203  013746  013702  003240                      MOV     XMTBUF,R2       ;ADDRESS OF START OF XMIT BUFFERS.
3204  013752                                50$:
3205  013752  012703  002420                      MOV     #$CCITT,R3      ;ADDRESS OF TEST PATTERN
3206  013756  012704  000040                      MOV     #32.,R4         ;# OF WORDS IN THE TEST PATTERN.
3207  013762                                51$:
```

```
3208  013762  012312                  MOV     (R3)+,(R2)      ;WRITE TEST PATTERN INTO ALL XMIT BUFFERS.
3209  013764  005300                  DEC     R0              ;ARE ALL THE XMIT BUFFERS WRITTEN?
3210  013766  001403                  BEQ     55$             ;IF YES PROCEED.
3211  013770  005304                  DEC     R4              ;CONTINUE WITH TEST PATTERN TILL DONE.
3212  013772  001373                  BNE     51$
3213  013774  000766                  BR      50$             ;START AT BEGINNING OF TEST PATTERN.
3214  013776                  55$:
3215  013776  013702  003640          MOV     RCVBUF,R2       ;ADDRESS OF RECEIVE BUFFERS
3216  014002                  56$:
3217  014002  005022                  CLR     (R2)+           ;CLEAR ALL RECEIVE BUFFERS.
3218  014004  005301                  DEC     R1
3219  014006  001375                  BNE     56$
3220
3221
3222  014010                  60$:
3223  014010  013700  003640          MOV     RCVBUF,R0       ;ADDRESS OF RECEIVE BUFFER
3224  014014  012701  003640          MOV     #RCVBUF,R1      ;TABLE ADDRESS OF RCV BUFFER POINTERS.
3225  014020  013702  002324          MOV     BUFNUM,R2       ;# OF RCV. BUFFERS.
3226  014024                  65$:
3227  014024  010021                  MOV     R0,(R1)+        ;SAVE THE RECEIVE BUFFER ADDRESS
3228  014026  013721  002322          MOV     BUFSIZ,(R1)+    ;SAVE THE BUFFER SIZE
3229  014032  063700  002322          ADD     BUFSIZ,R0       ;CALCULATE THE NEXT BUFFER ADDRESS.
3230  014036  005200                  INC     R0              ;CHANGE EVEN ADDRESS TO ODD & ODD TO EVEN.
3231  014040  005302                  DEC     R2              ;CALCULATE ALL THE BUFFER ADDRESSES.
3232  014042  001370                  BNE     65$
3233
3234  014044  013700  003240          MOV     XMTBUF,R0       ;ADDRESS OF TRANSMIT BUFFERS
3235  014050  012701  003240          MOV     #XMTBUF,R1      ;TABLE OF XMIT BUFFER POINTERS.
3236  014054  013702  002324          MOV     BUFNUM,R2       ;#OF XMIT BUFFERS.
3237  014060  012703  000004          MOV     #4,R3           ;R3 IS USED TO VARY THE CHARACTER COUNT.
3238  014064                  70$:
3239  014064  010021                  MOV     R0,(R1)+        ;SAVE THE XMIT BUFFER ADDRESS.
3240  014066  013711  002322          MOV     BUFSIZ,(R1)     ;SAVE THE BUFFER SIZE.
3241  014072  160321                  SUB     R3,(R1)+        ;VARY THE BUFFER SIZE
3242  014074  063700  002322          ADD     BUFSIZ,R0       ;CALCULATE THE NEXT BUFFER ADDRESS
3243  014100  005303                  DEC     R3              ;CHANGE THE CHARACTER COUNT VARIABLE.
3244  014102  032703  000001          BIT     #BIT0,R3        ;IS THE CONTENTS OF R3 ODD
3245  014106  001001                  BNE     72$             ;IF YES, DON'T ADJUST BUFFER ADDRESS.
3246  014110  005200                  INC     R0              ;CHANGE EVEN TO ODD ETC.
3247  014112                  72$:
3248  014112  005703                  TST     R3              ;WHAT IS R3.
3249  014114  002002                  BGE     75$             ;CONTINUE UNTIL R3 = -1
3250  014116  012703  000004          MOV     #4,R3           ;RE-INIT. THE R3 VARIABLE AGAIN.
3251  014122                  75$:
3252  014122  005302                  DEC     R2              ;CALCULATE ALL THE XMIT BUFFERS.
3253  014124  001357                  BNE     70$
3254
3255  014126  005037  002352          CLR     NXMFLG          ;RESTORE FLAG USED IN TRAP VECTOR.
3256  014132  005037  002374          CLR     SUBRPC          ;CLEAR PC.
3257  014136  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
                        ;
                        ;;*****************************************************************************
                        ;;*****************************************************************************
014140                  $INOUT:
014140  011637  002374          MOV     (SP),SUBRPC     ;SAVE THE PC AFTER THE CALL TO $LOOP
014144  162737  000004  002374  SUB     #4,SUBRPC       ;BACKUP TO THE PC OF THE ACTUAL CALL.
014152  012737  000001  002376  MOV     #1,NESTPC       ;FLAG THAT ANY SUBROUTINE USED WILL BE NESTED.
014160  013737  002324  002326  MOV     BUFNUM,INRCV    ;# OF BA/CC IN RECEIVES
014166  013737  002324  002330  MOV     BUFNUM,INXMIT   ;# OF BA/CC IN TRANSMITS
014174  013737  002324  002332  MOV     BUFNUM,OUTRCV   ;# OF BA/CC OUT RECEIVES
014202  013737  002324  002334  MOV     BUFNUM,OUTXMT   ;# OF BA/CC OUT TRANSMITS
014210  005037  002354          CLR     INFLAG          ;CLEAR INPUT BA/CC FLAG
014214  005037  002356          CLR     OUTFLG          ;CLEAR OUTPUT BA/CC FLAG
014220  005037  002272          CLR     START           ;CLEAR FLAG TO SHOW START UP NOT DONE (SET
                                                        ;AFTER CONTROL IN)
014224  012702  003640          MOV     #RCVBUF,R2      ;ADDR OF RCV. BUFFER TABLE (FOR INPUT)
014230  012703  003240          MOV     #XMTBUF,R3      ;ADDR OF XMIT BUFFER TABLE (FOR INPUT)
014234  012704  003640          MOV     #RCVBUF,R4      ;ADDR OF RCV. BUFFER TABLE (OUTPUT CHECKING)
014240  012705  003240          MOV     #XMTBUF,R5      ;ADDR OF XMIT BUFFER TABLE (OUTPUT CHECKING)
014244                  SETPRI  #PRI04          ;SET THE PRIORITY TO LEVEL 4 TO ALLOW THE
                                                                                MOV     #PRI04,R0
014250  104441                                                                  TRAP    C$SPRI
                                                        ;DMR TO INTERRUPT AT LEVEL 5
014252  013737  002316  002320  MOV     WAIT3,WAIT4     ;TIMEOUT COUNTER DETERMINED BY BAUD RATE.
014260  112777  000143  165744  MOVB    #IESET!RQI!BASEI,@BSEL0 ;FIRST COMMAND - BASE IN.
014266                  8$:
014266  012701  001000          MOV     #1000,R1        ;INNER LOOP COUNTER
014272                  10$:
014272                  BREAK                   ;OPERATOR INTERRUPT ENABLE.  CALL TO
014272  104422                                                                  TRAP    C$BRK
                                                        ;THE SUPERVISOR TO ALLOW CONSOLE INTERRUPT
                                                        ;(NOTE: INFLAG AND OUTFLG SET IN THE INTERRUPT
                                                        ;SERVICE ROUTINES)
014274  005737  002354          TST     INFLAG          ;ARE THE INPUTS DONE?   (INISR DONE?)
014300  001403          BEQ     12$             ;IF NOT KEEP CHECKING.
014302  005737  002356          TST     OUTFLG          ;ARE THE OUTPUTS DONE?  (OUTISR DONE?)
014306  001026          BNE     20$             ;IF YES EXIT WAIT LOOP.
014310                  12$:
```

```
3314  014310                                DELAY   1               ;WAIT 100 MICROSECONDS.
3315  014310  012727  000001                                                MOV     #1,(PC)+
3316  014314  000000                                                .WORD   0
3317  014316  013727  002116                                                MOV     L$DLY,(PC)+
3318  014322  000000                                                .WORD   0
3319  014324  005367  177772                                                DEC     -6(PC)
3320  014330  001375                                                BNE     .-4
3321  014332  005367  177756                                                DEC     -22(PC)
3322  014336  001367                                                BNE     .-20
3323  014340  005301                        DEC     R1              ;CONTINUE IN LOOP UNTIL R1 = 0.
3324  014342  001353                        BNE     10$
3325  014344  005337  002320                DEC     WAIT4           ;DECREMENT OUTER LOOP COUNTER
3326  014350  001346                        BNE     8$              ;IF NOT DONE - GO THROUGH INNER LOOP AGAIN.
3327  014352                                ERRDF   2,EMG2,ERRG1    ;TIMEOUT MESSAGE.
3328  014352  104455                                                TRAP    C$ERDF
3329  014354  000002                                                .WORD   2
3330  014356  017727                                                .WORD   EMG2
3331  014360  014616                                                .WORD   ERRG1
3332                                                                ;ALSO PRINT # OF BUFFERS NOT COMPLETE.
3333
3334  014362  000453                        BR      60$             ;EXIT
3335  014364                        20$:
3336
3337  014364  012700  003640                MOV     #RCVBUF,R0      ;RECEIVE BUFFER POINTER TABLE ADDRESS.
3338  014370  012701  003240                MOV     #XMTBUF,R1      ;TRANSMIT BUFFERS
3339  014374  013702  002324                MOV     BUFNUM,R2       ;# OF RCV. AND XMIT BUFFERS.
3340  014400  005737  002302                TST     MMANAG          ;ARE THE BUFFERS MEMORY MANAGED?
3341  014404  001403                        BEQ     40$             ;IF YES - PROCEED.
3342  014406  012737  000001  177572        MOV     #1,@#177572     ;TURN ON MEMORY MANAGEMENT
3343  014414                        40$:
3344  014414  012003                        MOV     (R0)+,R3        ;ADDRESS OF A RECEIVE BUFFER.
3345  014416  012104                        MOV     (R1)+,R4        ;ADDRESS OF A TRANSMIT BUFFER.
3346  014420  011005                        MOV     @R0,R5          ;CHARACTER COUNT.
3347  014422  022021                        CMP     (R0)+,(R1)+     ;ARE THE CHARACTER COUNTS THE SAME?
3348  014424  001412                        BEQ     45$             ;IF YES - PROCEED.
3349  014426  005737  002302                TST     MMANAG          ;IS MEMORY MANAGEMENT TURNED ON?
3350  014432  001402                        BEQ     41$             ;IF NOT - SKIP TURN OFF.
3351  014434  005037  177572                CLR     @#177572        ;TURN OFF MEMORY MANAGEMENT.
3352  014440                        41$:
3353  014440                                ERRDF   12,EMG12,ERRG10
3354  014440  104455                                                TRAP    C$ERDF
3355  014442  000014                                                .WORD   12
3356  014444  020141                                                .WORD   EMG12
3357  014446  016164                                                .WORD   ERRG10
3358  014450  000420                        BR      60$             ;EXIT
3359  014452                        45$:
3360  014452  122324                        CMPB    (R3)+,(R4)+     ;ARE THE CHARACTERS THE SAME?
3361  014454  001005                        BNE     50$             ;IF NOT - ERROR EXIT
3362  014456  005305                        DEC     R5              ;CHECK ALL THE CHARACTERS
3363  014460  001374                        BNE     45$
3364  014462  005302                        DEC     R2              ;CHECK ALL THE BUFFERS.
3365  014464  001353                        BNE     40$
3366  014466  000411                        BR      60$
3367  014470                        50$:
3368  014470  005737  002302                TST     MMANAG          ;IS MEMORY MANAGEMENT TURNED ON?
3369  014474  001402                        BEQ     51$             ;IF NOT - SKIP TURN OFF.
```

```
3370  014476  005037  177572          CLR     @#177572        ;TURN OFF MEMORY MANAGEMENT.
3371  014502                  51$:
3372  014502                          ERRDF   15,EMG15,ERRG12
3373  014502  104455                                                          TRAP    C$ERDF
3374  014504  000017                                                          .WORD   15
3375  014506  020235                                                          .WORD   EMG15
3376  014510  016250                                                          .WORD   ERRG12
3377  014512                  60$:
3378  014512  005737  002302          TST     MMANAG          ;IS MEMORY MANAGEMENT TURNED ON?
3379  014516  001402                  BEQ     61$             ;IF NOT - SKIP TURN OFF.
3380  014520  005037  177572          CLR     @#177572        ;TURN OFF MEMORY MANAGEMENT.
3381  014524                  61$:
3382  014524  042777  000120  165500  BIC     #IESET!IECLR,@SEL0 ;DISABLE BOTH INPUT INTERRUPTS
3383  014532  042777  000100  165474  BIC     #IE0,@SEL2      ;DISABLE OUTPUT INTERRUPT
3384  014540  022737  000021  002114  CMP     #17.,L$TEST     ;IS THIS TEST 17, 18 OR 19 ?
3385  014546  003011                  BGT     62$             ;IF NOT - SHUTDOWN.
3386                                                          ;NOTE:
3387                                                          ;DOING AN UPDATE IN TESTS 17 - 19, ALLOWS
3388                                                          ;THE USER TO CHECK OUT REMOTE LOOPBACK BETER.
3389                                                          ;A SHUTDOWN WHEN TESTING THE REMOTE LOOPBACK,
3390                                                          ;WOULD CAUSE THE CONNECTION TO BE DROPPED.
3391  014550                          DMRIN   UPDATE          ;DO A DMR UPDATE.
3392                                                          ;**** MACRO EXPANSION ****
3393  014550  004737  012062          JSR     PC, $DMRIN      ;CALL DMR MODE INPUT ROUTINE
3394  014554  000011                  .WORD   UPDATE          ;INPUT COMMAND
3395  014556  000000                  .WORD   0               ;NO SEL4
3396  014560  000000                  .WORD   0               ;NO SEL6
3397                                                          ;****                   ****
3398  014562                          WAIT    RDO             ;WAIT FOR RDO
3399                                                          ;**** MACRO EXPANSION ****
3400  014562  004737  010276          JSR     PC, $WAIT       ;CALL WAIT ROUTINE
3401  014566  000001                  .WORD   1               ;FLAG THAT WE'RE WAITING FOR RDO
3402                                                          ;****                   ****
3403  014570  000402                  BR      63$
3404  014572                  62$:
3405  014572                          SHUTDN                  ;SHUT DOWN THE DMR
3406                                                          ;**** MACRO EXPANSION ****
3407  014572  004737  012562          JSR     PC, $HALT       ;DMR HALT ROUTINE.
3408                                                          ;****                   ****
3409  014576                  63$:
3410  014576                          SETPRI  #PRI07          ;RETURN PROCESSOR PRIORITY TO 7
3411  014576  012700  000340                                                  MOV     #PRI07,R0
3412  014602  104441                                                          TRAP    C$SPRI
3413  014604  005037  002376          CLR     NESTPC          ;CLEAR NESTED FLAG.
3414  014610  005037  002374          CLR     SUBRPC          ;CLEAR PC.
3415  014614  000207                  RETURN
3416
3417
3418
3419
3420
3421
3422
3423
```

```
3424                                    .SBTTL  GLOBAL ERROR REPORT REPORT SECTION
3425                                    ;////////////////////////////////////////////////////////////////////////
3426                                    ;/    THE GLOBAL ERROR REPORT SECTION CONTAINS ERROR MESSAGES
3427                                    ;/    THAT ARE USED IN MORE THAN ONE TEST.
3428                                    ;////////////////////////////////////////////////////////////////////////
3429                                            .EVEN
3430
3431  014616                            BGNMSG  ERRG1
3432  014616                                                                              ERRG1::
3433  014616                                    PRINTB  #FMG3,SUBRPC    ;PC THAT SUBROUTINE WAS CALLED.
3434  014616  013746  002374                                                            MOV     SUBRPC,-(SP)
3435  014622  012746  016366                                                            MOV     #FMG3,-(SP)
3436  014626  012746  000002                                                            MOV     #2,-(SP)
3437  014632  010600                                                                    MOV     SP,R0
3438  014634  104414                                                                    TRAP    C$PNTB
3439  014636  062706  000006                                                            ADD     #6,SP
3440  014642                                    PRINTB  #FMG1,@SEL0,@SEL2 ;PRINT SEL0 AND SEL2 CONTENTS.
3441  014642  017746  165366                                                            MOV     @SEL2,-(SP)
3442  014646  017746  165360                                                            MOV     @SEL0,-(SP)
3443  014652  012746  016302                                                            MOV     #FMG1,-(SP)
3444  014656  012746  000003                                                            MOV     #3,-(SP)
3445  014662  010600                                                                    MOV     SP,R0
3446  014664  104414                                                                    TRAP    C$PNTB
3447  014666  062706  000010                                                            ADD     #10,SP
3448  014672                                    PRINTB  #FMG2,@SEL4,@SEL6 ;PRINT SEL4 AND SEL2 CONTENTS.
3449  014672  017746  165342                                                            MOV     @SEL6,-(SP)
3450  014676  017746  165334                                                            MOV     @SEL4,-(SP)
3451  014702  012746  016334                                                            MOV     #FMG2,-(SP)
3452  014706  012746  000003                                                            MOV     #3,-(SP)
3453  014712  010600                                                                    MOV     SP,R0
3454  014714  104414                                                                    TRAP    C$PNTB
3455  014716  062706  000010                                                            ADD     #10,SP
3456  014722                                    PRINTB  #FMG21,BUFNUM   ;# OF BUFFERS
3457  014722  013746  002324                                                            MOV     BUFNUM,-(SP)
3458  014726  012746  017461                                                            MOV     #FMG21,-(SP)
3459  014732  012746  000002                                                            MOV     #2,-(SP)
3460  014736  010600                                                                    MOV     SP,R0
3461  014740  104414                                                                    TRAP    C$PNTB
3462  014742  062706  000006                                                            ADD     #6,SP
3463  014746                                    PRINTB  #FMG22,BUFSIZ   ;BUFFER SIZE
3464  014746  013746  002322                                                            MOV     BUFSIZ,-(SP)
3465  014752  012746  017527                                                            MOV     #FMG22,-(SP)
3466  014756  012746  000002                                                            MOV     #2,-(SP)
3467  014762  010600                                                                    MOV     SP,R0
3468  014764  104414                                                                    TRAP    C$PNTB
3469  014766  062706  000006                                                            ADD     #6,SP
3470  014772  005437  002326           NEG     INRCV           ;NEGATE BUFFER VALUES
3471  014776  005437  002330           NEG     INXMIT
3472  015002  005437  002332           NEG     OUTRCV
3473  015006  005437  002334           NEG     OUTXMT
3474  015012  063737  002324  002326   ADD     BUFNUM,INRCV    ;CALCULATE BUFFERS ASSIGNED.
3475  015020  063737  002324  002330   ADD     BUFNUM,INXMIT
3476  015026  063737  002324  002332   ADD     BUFNUM,OUTRCV   ;CALCULATE BUFFERS RECEIVED.
3477  015034  063737  002324  002334   ADD     BUFNUM,OUTXMT
3478  015042                           PRINTB  #FMG23,INRCV,INXMIT
3479  015042  013746  002330                                                            MOV     INXMIT,-(SP)
```

```
3480  015046  013746  002326                                                    MOV     INRCV,-(SP)
3481  015052  012746  017554                                                    MOV     #FMG23,-(SP)
3482  015056  012746  000003                                                    MOV     #3,-(SP)
3483  015062  010600                                                           MOV     SP,R0
3484  015064  104414                                                           TRAP    C$PNTB
3485  015066  062706  000010                                                   ADD     #10,SP
3486  015072                        PRINTB  #FMG24,OUTRCV,OUTXMT
3487  015072  013746  002334                                                    MOV     OUTXMT,-(SP)
3488  015076  013746  002332                                                    MOV     OUTRCV,-(SP)
3489  015102  012746  017635                                                    MOV     #FMG24,-(SP)
3490  015106  012746  000003                                                    MOV     #3,-(SP)
3491  015112  010600                                                           MOV     SP,R0
3492  015114  104414                                                           TRAP    C$PNTB
3493  015116  062706  000010                                                   ADD     #10,SP
3494  015122                  ENDMSG
3495  015122                                                          L10002:
3496  015122  104423                                                           TRAP    C$MSG
3497
3498
3499  015124                  BGNMSG  ERRG2
3500  015124                                                          ERRG2::
3501  015124  005737  002374          TST     SUBRPC          ;IS THE ERROR IN A SUBROUTINE?
3502  015130  001412                  BEQ     10$             ;IF NOT, DON'T PRINT SUBR. PC
3503  015132                        PRINTB  #FMG3,SUBRPC    ;PC THAT SUBROUTINE WAS CALLED.
3504  015132  013746  002374                                                    MOV     SUBRPC,-(SP)
3505  015136  012746  016366                                                    MOV     #FMG3,-(SP)
3506  015142  012746  000002                                                    MOV     #2,-(SP)
3507  015146  010600                                                           MOV     SP,R0
3508  015150  104414                                                           TRAP    C$PNTB
3509  015152  062706  000006                                                   ADD     #6,SP
3510  015156                  10$:
3511  015156                        PRINTB  #FMG1,@SEL0,@SEL2 ;PRINT SEL0 AND SEL2 CONTENTS.
3512  015156  017746  165052                                                    MOV     @SEL2,-(SP)
3513  015162  017746  165044                                                    MOV     @SEL0,-(SP)
3514  015166  012746  016302                                                    MOV     #FMG1,-(SP)
3515  015172  012746  000003                                                    MOV     #3,-(SP)
3516  015176  010600                                                           MOV     SP,R0
3517  015200  104414                                                           TRAP    C$PNTB
3518  015202  062706  000010                                                   ADD     #10,SP
3519  015206                        PRINTB  #FMG2,@SEL4,@SEL6 ;PRINT SEL4 AND SEL2 CONTENTS.
3520  015206  017746  165026                                                    MOV     @SEL6,-(SP)
3521  015212  017746  165020                                                    MOV     @SEL4,-(SP)
3522  015216  012746  016334                                                    MOV     #FMG2,-(SP)
3523  015222  012746  000003                                                    MOV     #3,-(SP)
3524  015226  010600                                                           MOV     SP,R0
3525  015230  104414                                                           TRAP    C$PNTB
3526  015232  062706  000010                                                   ADD     #10,SP
3527  015236                  ENDMSG
3528  015236                                                          L10003:
3529  015236  104423                                                           TRAP    C$MSG
3530
3531  015240                  BGNMSG  ERRG3
3532  015240                                                          ERRG3::
3533  015240  005737  002374          TST     SUBRPC          ;IS THE ERROR IN A SUBROUTINE?
3534  015244  001412                  BEQ     10$             ;IF NOT, DON'T PRINT SUBR. PC
3535  015246                        PRINTB  #FMG3,SUBRPC    ;PC THAT SUBROUTINE WAS CALLED.
```

```
3536  015246  013746  002374                                                  MOV     SUBRPC,-(SP)
3537  015252  012746  016366                                                  MOV     #FMG3,-(SP)
3538  015256  012746  000002                                                  MOV     #2,-(SP)
3539  015262  010600                                                          MOV     SP,R0
3540  015264  104414                                                          TRAP    C$PNTB
3541  015266  062706  000006                                                  ADD     #6,SP
3542  015272                        10$:
3543  015272                                PRINTB  #FMG1,@SEL0,@SEL2 ;PRINT SEL0 AND SEL2 CONTENTS.
3544  015272  017746  164736                                                  MOV     @SEL2,-(SP)
3545  015276  017746  164730                                                  MOV     @SEL0,-(SP)
3546  015302  012746  016302                                                  MOV     #FMG1,-(SP)
3547  015306  012746  000003                                                  MOV     #3,-(SP)
3548  015312  010600                                                          MOV     SP,R0
3549  015314  104414                                                          TRAP    C$PNTB
3550  015316  062706  000010                                                  ADD     #10,SP
3551  015322  032777  100000  164702        BIT     #RUN,@SEL0      ;IS THE RUN BIT SET
3552  015330  001043                        BNE     20$             ;IF RUN SET, CHECK.
3553  015332  122777  000001  164704        CMPB    #1,@BSEL3       ;DID CPU MICRO. FAIL?
3554  015340  001011                        BNE     12$             ;IF NOT SEE IF LU FAILED.
3555  015342                                PRINTB  #FMG4           ;CPU MICRO. FAILED.
3556  015342  012746  016440                                                  MOV     #FMG4,-(SP)
3557  015346  012746  000001                                                  MOV     #1,-(SP)
3558  015352  010600                                                          MOV     SP,R0
3559  015354  104414                                                          TRAP    C$PNTB
3560  015356  062706  000004                                                  ADD     #4,SP
3561  015362  000441                        BR      25$
3562  015364                        12$:
3563  015364  122777  000002  164652        CMPB    #2,@BSEL3       ;DID LINE UNIT MICRO. FAIL?
3564  015372  001011                        BNE     15$
3565  015374                                PRINTB  #FMG5           ;LINE UNIT FAILED.
3566  015374  012746  016471                                                  MOV     #FMG5,-(SP)
3567  015400  012746  000001                                                  MOV     #1,-(SP)
3568  015404  010600                                                          MOV     SP,R0
3569  015406  104414                                                          TRAP    .C$PNTB
3570  015410  062706  000004                                                  ADD     #4,SP
3571  015414  000424                        BR      25$
3572  015416                        15$:
3573  015416                                PRINTB  #FMG5           ;NO RUN - MASTER CLEAR FAILED.
3574  015416  012746  016471                                                  MOV     #FMG5,-(SP)
3575  015422  012746  000001                                                  MOV     #1,-(SP)
3576  015426  010600                                                          MOV     SP,R0
3577  015430  104414                                                          TRAP    C$PNTB
3578  015432  062706  000004                                                  ADD     #4,SP
3579  015436  000413                        BR      25$
3580  015440                        20$:
3581  015440  105777  164600                TSTB    @BSEL3          ;IS BSEL3 STILL 0?
3582  015444  001010                        BNE     25$             ;IF NOT - SEE IF MICRODIAG. RUN.
3583  015446                                PRINTB  #FMG19          ;DEVICE IS NOT DMR (DMC?)
3584  015446  012746  017436                                                  MOV     #FMG19,-(SP)
3585  015452  012746  000001                                                  MOV     #1,-(SP)
3586  015456  010600                                                          MOV     SP,R0
3587  015460  104414                                                          TRAP    C$PNTB
3588  015462  062706  000004                                                  ADD     #4,SP
3589  015466                        25$:
3590  015466                        ENDMSG
3591  015466                                                          L10004:
```

```
3592  015466  104423                                                          TRAP    C$MSG
3593
3594
3595  015470                        BGNMSG  ERRG4
3596  015470                                                                          ERRG4::
3597  015470  005737  002374                TST     SUBRPC          ;IS THE ERROR IN A SUBROUTINE?
3598  015474  001412                        BEQ     10$             ;IF NO, DON'T PRINT SUBR. PC
3599  015476                                PRINTB  #FMG3,SUBRPC    ;PC THAT SUBROUTINE WAS CALLED.
3600  015476  013746  002374                                                  MOV     SUBRPC,-(SP)
3601  015502  012746  016366                                                  MOV     #FMG3,-(SP)
3602  015506  012746  000002                                                  MOV     #2,-(SP)
3603  015512  010600                                                          MOV     SP,R0
3604  015514  104414                                                          TRAP    C$PNTB
3605  015516  062706  000006                                                  ADD     #6,SP
3606  015522                        10$:
3607  015522  105737  002643                TSTB    BASE+3          ;ONLY PRINT NON-ZERO VALUES
3608  015526  001003                        BNE     11$
3609  015530  105737  002646                TSTB    BASE+6
3610  015534  001416                        BEQ     12$
3611  015536                        11$:
3612  015536                                PRINTB  #FMG7,<B,BASE+3>,<B,BASE+6>
3613  015536  005046                                                          CLR     -(SP)
3614  015540  153716  002646                                                  BISB    BASE+6,(SP)
3615  015544  005046                                                          CLR     -(SP)
3616  015546  153716  002643                                                  BISB    BASE+3,(SP)
3617  015552  012746  016522                                                  MOV     #FMG7,-(SP)
3618  015556  012746  000003                                                  MOV     #3,-(SP)
3619  015562  010600                                                          MOV     SP,R0
3620  015564  104414                                                          TRAP    C$PNTB
3621  015566  062706  000010                                                  ADD     #10,SP
3622  015572                        12$:
3623  015572  105737  002645                TSTB    BASE+5
3624  015576  001003                        BNE     13$
3625  015600  105737  002650                TSTB    BASE+8.
3626  015604  001416                        BEQ     14$
3627  015606                        13$:
3628  015606                                PRINTB  #FMG8,<B,BASE+5>,<B,BASE+8.>
3629  015606  005046                                                          CLR     -(SP)
3630  015610  153716  002650                                                  BISB    BASE+8.,(SP)
3631  015614  005046                                                          CLR     -(SP)
3632  015616  153716  002645                                                  BISB    BASE+5,(SP)
3633  015622  012746  016573                                                  MOV     #FMG8,-(SP)
3634  015626  012746  000003                                                  MOV     #3,-(SP)
3635  015632  010600                                                          MOV     SP,R0
3636  015634  104414                                                          TRAP    C$PNTB
3637  015636  062706  000010                                                  ADD     #10,SP
3638  015642                        14$:
3639  015642  105737  002644                TSTB    BASE+4
3640  015646  001003                        BNE     15$
3641  015650  105737  002647                TSTB    BASE+7
3642  015654  001416                        BEQ     16$
3643  015656                        15$:
3644  015656                                PRINTB  #FMG9,<B,BASE+4>,<B,BASE+7>
3645  015656  005046                                                          CLR     -(SP)
3646  015660  153716  002647                                                  BISB    BASE+7,(SP)
3647  015664  005046                                                          CLR     -(SP)
```

```
3648  015666  153716  002644                                                          BISB    BASE+4,(SP)
3649  015672  012746  016644                                                          MOV     #FMG9,-(SP)
3650  015676  012746  000003                                                          MOV     #3,-(SP)
3651  015702  010600                                                                 MOV     SP,R0
3652  015704  104414                                                                 TRAP    C$PNTB
3653  015706  062706  000010                                                         ADD     #10,SP
3654  015712                        16$:
3655  015712  105737  002652                TSTB    BASE+10.
3656  015716  001003                        BNE     17$
3657  015720  105737  002651                TSTB    BASE+9.
3658  015724  001416                        BEQ     20$
3659  015726                        17$:
3660  015726                                PRINTB  #FMG10,<B,BASE+10.>,<B,BASE+9.>
3661  015726  005046                                                                 CLR     -(SP)
3662  015730  153716  002651                                                         BISB    BASE+9.,(SP)
3663  015734  005046                                                                 CLR     -(SP)
3664  015736  153716  002652                                                         BISB    BASE+10.,(SP)
3665  015742  012746  016715                                                         MOV     #FMG10,-(SP)
3666  015746  012746  000003                                                         MOV     #3,-(SP)
3667  015752  010600                                                                 MOV     SP,R0
3668  015754  104414                                                                 TRAP    C$PNTB
3669  015756  062706  000010                                                         ADD     #10,SP
3670  015762                        20$:
3671  015762                        ENDMSG
3672  015762                                                              L10005:
3673  015762  104423                                                                 TRAP    C$MSG
3674
3675
3676
3677  015764                        BGNMSG  ERRG7
3678  015764                                                              ERRG7::
3679  015764                                PRINTB  #FMG12          ;BA/CC OUT RECV
3680  015764  012746  017005                                                         MOV     #FMG12,-(SP)
3681  015770  012746  000001                                                         MOV     #1,-(SP)
3682  015774  010600                                                                 MOV     SP,R0
3683  015776  104414                                                                 TRAP    C$PNTB
3684  016000  062706  000004                                                         ADD     #4,SP
3685  016004                                PRINTB  #FMG13,@SEL4,@SEL6 ;ACTUAL BA/CC
3686  016004  017746  164230                                                         MOV     @SEL6,-(SP)
3687  016010  017746  164222                                                         MOV     @SEL4,-(SP)
3688  016014  012746  017036                                                         MOV     #FMG13,-(SP)
3689  016020  012746  000003                                                         MOV     #3,-(SP)
3690  016024  010600                                                                 MOV     SP,R0
3691  016026  104414                                                                 TRAP    C$PNTB
3692  016030  062706  000010                                                         ADD     #10,SP
3693  016034                                PRINTB  #FMG15,-2(R4)       ;EXPECTED BA/CC
3694  016034  016446  177776                                                         MOV     -2(R4),-(SP)
3695  016040  012746  017166                                                         MOV     #FMG15,-(SP)
3696  016044  012746  000002                                                         MOV     #2,-(SP)
3697  016050  010600                                                                 MOV     SP,R0
3698  016052  104414                                                                 TRAP    C$PNTB
3699  016054  062706  000006                                                         ADD     #6,SP
3700  016060                        ENDMSG
3701  016060                                                              L10006:
3702  016060  104423                                                                 TRAP    C$MSG
3703
```

```
3704  016062                          BGNMSG  ERRG8
3705  016062                                                                  ERRG8::
3706  016062                                  PRINTB  #FMG11          ;BA/CC OUT XMIT
3707  016062  012746  016753                                                          MOV     #FMG11,-(SP)
3708  016066  012746  000001                                                          MOV     #1,-(SP)
3709  016072  010600                                                                  MOV     SP,R0
3710  016074  104414                                                                  TRAP    C$PNTB
3711  016076  062706  000004                                                          ADD     #4,SP
3712  016102                                  PRINTB  #FMG13,@SEL4,@SEL6   ;ACTUAL BA/CC
3713  016102  017746  164132                                                          MOV     @SEL6,-(SP)
3714  016106  017746  164124                                                          MOV     @SEL4,-(SP)
3715  016112  012746  017036                                                          MOV     #FMG13,-(SP)
3716  016116  012746  000003                                                          MOV     #3,-(SP)
3717  016122  010600                                                                  MOV     SP,R0
3718  016124  104414                                                                  TRAP    C$PNTB
3719  016126  062706  000010                                                          ADD     #10,SP
3720  016132                                  PRINTB  #FMG14,-4(R5),-2(R5) ;EXPECTED BA/CC
3721  016132  016546  177776                                                          MOV     -2(R5),-(SP)
3722  016136  016546  177774                                                          MOV     -4(R5),-(SP)
3723  016142  012746  017112                                                          MOV     #FMG14,-(SP)
3724  016146  012746  000003                                                          MOV     #3,-(SP)
3725  016152  010600                                                                  MOV     SP,R0
3726  016154  104414                                                                  TRAP    C$PNTB
3727  016156  062706  000010                                                          ADD     #10,SP
3728  016162                          ENDMSG
3729  016162                                                                  L10007:
3730  016162  104423                                                                  TRAP    C$MSG
3731
3732
3733  016164                          BGNMSG  ERRG10
3734  016164                                                                  ERRG10::
3735  016164                                  PRINTB  #FMG16,-2(R0),-2(R1) ;RCV CC & XMIT CC
3736  016164  016146  177776                                                          MOV     -2 R1),-(SP)
3737  016170  016046  177776                                                          MOV     -2(R0),-(SP)
3738  016174  012746  017215                                                          MOV     #FMG16,-(SP)
3739  016200  012746  000003                                                          MOV     #3,-(SP)
3740  016204  010600                                                                  MOV     SP,R0
3741  016206  104414                                                                  TRAP    C$PNTB
3742  016210  062706  000010                                                          ADD     #10,SP
3743  016214                          ENDMSG
3744  016214                                                                  L10010:
3745  016214  104423                                                                  TRAP    C$MSG
3746
3747  016216                          BGNMSG  ERRG11
3748  016216                                                                  ERRG11::
3749  016216                                  PRINTB  #FMG17,-4(R0),-4(R1) ;RCV BUFFER & XMIT BUFFER
3750  016216  016146  177774                                                          MOV     -4(R1),-(SP)
3751  016222  016046  177774                                                          MOV     -4(R0),-(SP)
3752  016226  012746  017274                                                          MOV     #FMG17,-(SP)
3753  016232  012746  000003                                                          MOV     #3,-(SP)
3754  016236  010600                                                                  MOV     SP,R0
3755  016240  104414                                                                  TRAP    C$PNTB
3756  016242  062706  000010                                                          ADD     #10,SP
3757  016246                          ENDMSG
3758  016246                                                                  L10011:
3759  016246  104423                                                                  TRAP    C$MSG
```

```
                                        BGNMSG  ERRG12
                                                                                ERRG12::
                                                DEC     R3              ;BACKUP TO RECEIVE ADDRESS
                                                DEC     R4              ;BACKUP TO TRANSMIT ADDRESS
                                                PRINTB  #FMG18,R3,R4    ;PRINT OUT ADDRESS
                                                                                        MOV     R4,-(SP)
                                                                                        MOV     R3,-(SP)
                                                                                        MOV     #FMG18,-(SP)
                                                                                        MOV     #3,-(SP)
                                                                                        MOV     SP,R0
                                                                                        TRAP    C$PNTB
                                                                                        ADD     #10,SP
                                        ENDMSG
                                                                                L10012:
                                                                                        TRAP    C$MSG


016302  040445  042523  030114  FMG1:   .ASCIZ  /%ASEL0: %06%A SEL2: %06%N/
016310  020072  047445  022466
016316  020101  042523  031114
016324  020072  047445  022466
016332  000116
016334  040445  042523  032114  FMG2:   .ASCIZ  /%ASEL4: %06%A SEL6: %06%N/
016342  020072  047445  022466
016350  020101  042523  033114
016356  020072  047445  022466
016364  000116
016366  040445  051105  047522  FMG3:   .ASCIZ  /%AERROR IN SUBROUTINE CALLED AT PC: %06%N/
016374  020122  047111  051440
016402  041125  047522  052125
016410  047111  020105  040503
016416  046114  042105  040440
016424  020124  041520  020072
016432  047445  022466  000116
016440  040445  050103  020125  FMG4:   .ASCIZ  /%ACPU MICROTEST FAILED%N/
016446  044515  051103  052117
016454  051505  020124  040506
016462  046111  042105  047045
016470     000
016471     045  046101  027125  FMG5:   .ASCIZ  /%ALU. MICROTEST FAILED%N/
016476  046440  041511  047522
016504  042524  052123  043040
016512  044501  042514  022504
016520  000116
016522  040445  040516  051513  FMG7:   .ASCIZ  /%ANAKS-NO BUFFER  RCV: %D3%A SENT: %D3%N/
016530  047055  020117  052502
016536  043106  051105  020040
016544  041522  035126  022440
016552  031504  040445  051440
016560  047105  035124  022440
016566  031504  047045     000
```

```
3816  016573     045  047101  047501  FMG8:   .ASCIZ  /%ANAKS-BAD DATA   RCV: %D3%A SENT: %D3%N/
3817  016600  026523  040502  020104
3818  016606  040504  040524  020040
3819  016614  051040  053103  020072
3820  016622  042045  022463  020101
3821  016630  042523  052116  020072
3822  016636  042045  022463  000116
3823  016644  040445  040516  051513  FMG9:   .ASCIZ  /%ANAKS-BAD HEADER RCV: %D3%A SENT: %D3%N/
3824  016652  041055  042101  044040
3825  016660  040505  042504  020122
3826  016666  041522  035126  022440
3827  016674  031504  040445  051440
3828  016702  047105  035124  022440
3829  016710  031504  047045     000
3830  016715     045  051101  050105  FMG10:  .ASCIZ  /%AREPS-RCV: %D3%A SENT: %D3%N/
3831  016722  026523  041522  035126
3832  016730  022440  031504  040445
3833  016736  051440  047105  035124
3834  016744  022440  031504  047045
3835  016752     000
3836  016753     045  054101  044515  FMG11:  .ASCIZ  /%AXMIT BACC OUT COMMAND%N/
3837  016760  020124  040502  041503
3838  016766  047440  052125  041440
3839  016774  046517  040515  042116
3840  017002  047045     000
3841  017005     045  051101  053103  FMG12:  .ASCIZ  /%ARCV BACC OUT COMMAND%N/
3842  017012  041040  041501  020103
3843  017020  052517  020124  047503
3844  017026  046515  047101  022504
3845  017034  000116
3846  017036  040445  041501  052524  FMG13:  .ASCIZ  /%AACTUAL   ADDR. %06%A ACTUAL COUNT   %D5%N/
3847  017044  046101  020040  040440
3848  017052  042104  027122  022440
3849  017060  033117  040445  040440
3850  017066  052103  040525  020114
3851  017074  047503  047125  020124
3852  017102  020040  042045  022465
3853  017110  000116
3854  017112  040445  054105  042520  FMG14:  .ASCIZ  /%AEXPECTED ADDR. %06%A EXPECTED COUNT %D5%N/
3855  017120  052103  042105  040440
3856  017126  042104  027122  022440
3857  017134  033117  040445  042440
3858  017142  050130  041505  042524
3859  017150  020104  047503  047125
3860  017156  020124  042045  022465
3861  017164  000116
3862  017166  040445  054105  042520  FMG15:  .ASCIZ  /%AEXPECTED ADDR. %06%N/
3863  017174  052103  042105  040440
3864  017202  042104  027122  022440
3865  017210  033117  047045     000
3866  017215     045  051101  053103  FMG16:  .ASCIZ  /%ARCV CHAR. COUNT %D5%A XMIT CHAR. COUNT %D5%N/
3867  017222  041440  040510  027122
3868  017230  041440  052517  052116
3869  017236  022440  032504  040445
3870  017244  054040  044515  020124
3871  017252  044103  051101  020056
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3872  017260  047503  047125  020124
3873  017266  042045  022465  000116
3874  017274  040445  041522  020126  FMG17:  .ASCIZ  /%ARCV BUFFER AT %06%A XMIT BUFFER AT %06%N/
3875  017302  052502  043106  051105
3876  017310  040440  020124  047445
3877  017316  022466  020101  046530
3878  017324  052111  041040  043125
3879  017332  042506  020122  052101
3880  017340  022440  033117  047045
3881  017346     000
3882  017347     045  042101  052101  FMG18:  .ASCIZ  /%ADATA DIFFERS AT RCV ADDR. %06%A AND XMIT ADDR. %06%N/
3883  017354  020101  044504  043106
3884  017362  051105  020123  052101
3885  017370  051040  053103  040440
3886  017376  042104  027122  022440
3887  017404  033117  040445  040440
3888  017412  042116  054040  044515
3889  017420  020124  042101  051104
3890  017426  020056  047445  022466
3891  017434  000116
3892  017436  040445  042504  044526  FMG19:  .ASCIZ  /%ADEVICE NOT DMR%N/
3893  017444  042503  047040  052117
3894  017452  042040  051115  047045
3895  017460     000
3896  017461     045  041101  043125  FMG21:  .ASCIZ  /%ABUFFER STATUS%N%A# OF BUFFERS:%D3%N/
3897  017466  042506  020122  052123
3898  017474  052101  051525  047045
3899  017502  040445  020043  043117
3900  017510  041040  043125  042506
3901  017516  051522  022472  031504
3902  017524  047045     000
3903  017527     045  041101  043125  FMG22:  .ASCIZ  /%ABUFFER SIZE: %D5%N/
3904  017534  042506  020122  044523
3905  017542  042532  020072  042045
3906  017550  022465  000116
3907  017554  040445  047111  020040  FMG23:  .ASCIZ  /%AIN  - RCV ASSIGNED:%D3%A   XMIT ASSIGNED:%D3%N/
3908  017562  020055  041522  020126
3909  017570  051501  044523  047107
3910  017576  042105  022472  031504
3911  017604  040445  020040  054040
3912  017612  044515  020124  051501
3913  017620  044523  047107  042105
3914  017626  022472  031504  047045
3915  017634     000
3916  017635     045  047501  052125  FMG24:  .ASCIZ  /%AOUT - RCV RETURNED:%D3%A   XMIT RETURNED:%D3%N/
3917  017642  026440  051040  053103
3918  017650  051040  052105  051125
3919  017656  042516  035104  042045
3920  017664  022463  020101  020040
3921  017672  046530  052111  051040
3922  017700  052105  051125  042516
3923  017706  035104  042045  022463
3924  017714  000116
3925
3926  017716  044524  042515  047440  EMG1:   .ASCIZ  /TIME OUT/
3927  017724  052125     000
```

```
3928  017727     124  046511  020105  EMG2:   .ASCIZ  /TIME OUT - DURING INTERRUPT EXERCISE/
3929  017734  052517  020124  020055
3930  017742  052504  044522  043516
3931  017750  044440  052116  051105
3932  017756  052522  052120  042440
3933  017764  042530  041522  051511
3934  017772  000105
3935  017774  054105  042520  052103  EMG8:   .ASCIZ  /EXPECTED CONTROL OUT - NOT RECEIVED/
3936  020002  042105  041440  047117
3937  020010  051124  046117  047440
3938  020016  052125  026440  047040
3939  020024  052117  051040  041505
3940  020032  044505  042526  000104
3941  020040  047125  054105  042520  EMG9:   .ASCIZ  /UNEXPECTED CONTROL OUT/
3942  020046  052103  042105  041440
3943  020054  047117  051124  046117
3944  020062  047440  052125     000
3945  020067     105  051122  051117  EMG10:  .ASCIZ  /ERROR - MULTIPLE XMITS/
3946  020074  026440  046440  046125
3947  020102  044524  046120  020105
3948  020110  046530  052111  000123
3949  020116  052502  043106  051105  EMG11:  .ASCIZ  /BUFFER ADDR. ERROR/
3950  020124  040440  042104  027122
3951  020132  042440  051122  051117
3952  020140     000
3953  020141     103  040510  040522  EMG12:  .ASCIZ  /CHARACTER COUNT ERROR/
3954  020146  052103  051105  041440
3955  020154  052517  052116  042440
3956  020162  051122  051117     000
3957  020167     105  051122  051117  EMG13:  .ASCIZ  /ERROR - MULTIPLE RCVS/
3958  020174  026440  046440  046125
3959  020202  044524  046120  020105
3960  020210  041522  051526     000
3961  020215     122  053103  020104  EMG14:  .ASCIZ  /RCVD EXTRA DATA/
3962  020222  054105  051124  020101
3963  020230  040504  040524     000
3964  020235     104  052101  020101  EMG15:  .ASCIZ  /DATA ERROR/
3965  020242  051105  047522  000122
3966  020250  047125  054105  042520  EMG16:  .ASCIZ  /UNEXPECTED HALT RECEIVED/
3967  020256  052103  042105  044040
3968  020264  046101  020124  042522
3969  020272  042503  053111  042105
3970  020300     000
3971  020301     103  047117  051124  EMG17:  .ASCIZ  /CONTROL IN PROBLEM - IN INTERRUPT ROUTINE/
3972  020306  046117  044440  020116
3973  020314  051120  041117  042514
3974  020322  020115  020055  047111
3975  020330  044440  052116  051105
3976  020336  052522  052120  051040
3977  020344  052517  044524  042516
3978  020352     000
3979  020353     123  052520  044522  EMG18:  .ASCIZ  /SPURIOUS RDO INTERRUPT/
3980  020360  052517  020123  042122
3981  020366  020117  047111  042524
3982  020374  051122  050125  000124
3983  020402  034115  030062  020067  EMG19:  .ASCIZ  /M8207 PROGRAM TIMER OUT OF RANGE/
```

```
 3984  020410  051120  043517  040522
 3985  020416  020115  044524  042515
 3986  020424  020122  052517  020124
 3987  020432  043117  051040  047101
 3988  020440  042507     000
 3989          020444                  .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.
                                ;////////////////////////////////////////////////////////////////////////////

020444                                  BGNPROT
020444                                                                  L$PROT::

020444  177777                          .WORD   -1              ;DON'T CHECK CSR ADDRESS
020446  177777                          .WORD   -1              ;DON'T CHECK MASSBUS UNIT NUMBER
020450  177777                          .WORD   -1              ;DON'T CHECK DRIVE NUMBER

020452                                  ENDPROT
```

```
                                .SBTTL  INITIALIZE SECTION

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

020452                          BGNINIT
020452                                                                  L$INIT::

                                        SETPRI  #PRI07          ;SET DIAGNOSTIC PRIORITY = 7
020452  012700  000340                                                          MOV     #PRI07,R0
020456  104441                                                                  TRAP    C$SPRI
020460  010637  002372                MOV     SP,PSTACK       ;STORE BASE LEVEL PROGRAM STACK POINTER
020464  005037  002374                CLR     SUBRPC          ;CLEAR STORAGE WORD FOR SUBROUTINE PC CALL
020470  005037  002366                CLR     ERROR           ;CLEAR ERROR FLAGS
020474  005037  002274                CLR     RESUME          ;CLEAR FLAG USED TO ALLOW BASE IN - RESUME.
020500  005037  002276                CLR     DMCMDE          ;CLEAR FLAG USED TO INDICATE DMC MODE
020504  005037  002400                CLR     CLRNO           ;CLEAR WORD USED TO RUN MICRO TESTS ON
                                                                ;EVERY OTHER MASTER CLEAR.
020510  005037  002352                CLR     NXMFLG          ;FLAG USED TO MARK A NXM DMR ADDRESS.
020514  005737  002264                TST     FRSTIM          ;IS THIS THE TIME THROUGH AFTER LOAD?
020520  001005                        BNE     1$              ;IF NOT - ERROR TRAP VECTOR ALREADY SAVED
020522  012737  000001  002264        MOV     #1,FRSTIM       ;FLAG THAT WE'VE BEEN THRU THE 1ST TIME
020530  005037  002266                CLR     FRSPAS          ;CLEAR COUNTER FOR # OF PASSES AFTER LOAD

020534                          1$:
                                        CLRVEC  #4              ;ENSURE VECTOR 4 IS IN NORMAL STATE.
020534  012700  000004                                                          MOV     #4,R0
020540  104436                                                                  TRAP    C$CVEC

020542                                  READEF  #EF.START       ;IS THIS JUST STARTED?
020542  012700  000040                                                          MOV     #EF.START,R0
020546  104447                                                                  TRAP    C$REFG
020550                                  BCOMPLETE STARST        ;IF YES - BRANCH.
020550  103416                                                                  BCS     STARST
020552                                  READEF  #EF.RESTART     ;IS THIS A RESTART ?
020552  012700  000037                                                          MOV     #EF.RESTART,R0
020556  104447                                                                  TRAP    C$REFG
020560                                  BCOMPLETE STARST        ;IF YES - BRANCH.
020560  103412                                                                  BCS     STARST
020562                                  READEF  #EF.NEW         ;IS THIS A NEW PASS?
020562  012700  000035                                                          MOV     #EF.NEW,R0
020566  104447                                                                  TRAP    C$REFG
020570                                  BCOMPLETE NEWST         ;IF YES - BRANCH
020570  103410                                                                  BCS     NEWST
020572                                  READEF  #EF.CONTINUE    ;IS THIS A CONTINUATION?
020572  012700  000036                                                          MOV     #EF.CONTINUE,R0
020576  104447                                                                  TRAP    C$REFG
020600                                  BNCOMPLETE GETPRM       ;IF NOT - GET PARAMETERS
020600  103013                                                                  BCC     GETPRM
020602  000137  021510                JMP     END             ;OTHERWISE - DON'T INITIALIZE.

020606                          STARST:
020606  005037  002270                CLR     STARES          ;CLEAR THE FLAG TO SHOW START/RESTART.
```

```
4066  020612                          NEWST:
4067  020612  012737  177777  002370          MOV     #-1,LOGDEV      ;INITIALIZE LOGICAL UNIT NUMBER.
4068  020620  005237  002266                  INC     FRSPAS          ;INCREMENT # OF PASSES AFTER LOAD.
4069  020624  005237  002270                  INC     STARES          ;INCREMENT # OF PASSES SINCE START/RESTART.
4070  020630                          GETPRM:
4071  020630  005237  002370                  INC     LOGDEV          ;NEXT LOGICAL UNIT TO BE TESTED
4072  020634  023737  002370  002012          CMP     LOGDEV,L$UNIT   ;IS THE MAXIMUM UNIT # EXCEEDED?
4073  020642  002363                          BGE     NEWST           ;IF YES - DO A NEW START
4074  020644                                  GPHARD  LOGDEV,R1       ;GET THE P-TABLE POINTER INTO R1
4075  020644  013700  002370                                                          MOV     LOGDEV,R0
4076  020650  104442                                                                  TRAP    C$GPHRD
4077  020652  010001                                                                  MOV     R0,R1
4078  020654                                  BNCOMPLETE  GETPRM      ;IF NOT AVAILABLE, GET THE NEXT ONE
4079  020654  103365                                                                  BCC     GETPRM
4080  020656  012137  002252                  MOV     (R1)+,WTYPE     ;MICROPROCESSOR TYPE
4081  020662  011100                          MOV     (R1),R0         ;SAVE THE ADDRESS
4082  020664  032700  000007                  BIT     #7,R0           ;DOES THIS DEVICE ADDRESS END IN NON-ZERO?
4083  020670  001414                          BEQ     10$             ;IF NOT - OK (76XXX0)
4084  020672  042711  000007                  BIC     #7,(R1)         ;MAKE IT 76XXX0
4085  020676                                  PRINTB  #FINIT1,(R1),R0 ;INFORM THE USER
4086  020676  010046                                                                  MOV     R0,-(SP)
4087  020700  011146                                                                  MOV     (R1),-(SP)
4088  020702  012746  021512                                                          MOV     #FINIT1,-(SP)
4089  020706  012746  000003                                                          MOV     #3,-(SP)
4090  020712  010600                                                                  MOV     SP,R0
4091  020714  104414                                                                  TRAP    C$PNTB
4092  020716  062706  000010                                                          ADD     #10,SP
4093  020722                          10$:
4094  020722  011137  002232                  MOV     (R1),CSR        ;CSR ADDRESS
4095  020726  011137  002242                  MOV     (R1),BSEL1
4096  020732  005237  002242                  INC     BSEL1           ;HIGH BYTE ADDRESS OF CSR
4097  020736  011137  002234                  MOV     (R1),SEL2
4098  020742  062737  000002  002234          ADD     #2,SEL2         ;CONTROL OUT REGISTER ADDRESS
4099  020750  011137  002244                  MOV     (R1),BSEL3
4100  020754  062737  000003  002244          ADD     #3,BSEL3        ;HIGH BYTE OF SEL2
4101  020762  011137  002236                  MOV     (R1),SEL4
4102  020766  062737  000004  002236          ADD     #4,SEL4         ;PORT REG (SEL 4) ADDRESS
4103  020774  011137  002246                  MOV     (R1),BSEL5
4104  021000  062737  000005  002246          ADD     #5,BSEL5        ;HIGH BYTE OF SEL4
4105  021006  011137  002240                  MOV     (R1),SEL6
4106  021012  062737  000006  002240          ADD     #6,SEL6         ;PORT REG (SEL 6) ADDRESS
4107  021020  012137  002250                  MOV     (R1)+,BSEL7
4108  021024  062737  000007  002250          ADD     #7,BSEL7        ;HIGH BYTE OF SEL6
4109  021032  011100                          MOV     (R1),R0         ;GET VECTOR
4110  021034  032700  000007                  BIT     #7,R0           ;DOES THIS VECTOR END IN NON-ZERO?
4111  021040  001414                          BEQ     11$             ;IF NOT - OK (XX0)
4112  021042  042711  000007                  BIC     #7,(R1)         ;MAKE IT XX0
4113  021046                                  PRINTB  #FINIT2,(R1),R0 ;INFORM THE USER
4114  021046  010046                                                                  MOV     R0,-(SP)
4115  021050  011146                                                                  MOV     (R1),-(SP)
4116  021052  012746  021601                                                          MOV     #FINIT2,-(SP)
4117  021056  012746  000003                                                          MOV     #3,-(SP)
4118  021062  010600                                                                  MOV     SP,R0
4119  021064  104414                                                                  TRAP    C$PNTB
4120  021066  062706  000010                                                          ADD     #10,SP
4121  021072                          11$:
```

```
4122  021072  011137  002226                  MOV     (R1),DMRVEC     ;RCV. VECTOR
4123  021076  011137  002230                  MOV     (R1),DMTVEC     ;TRANSMIT VECTOR
4124  021102  011100                          MOV     (R1),R0         ;RCV. VECTOR
4125  021104  105060  000003                  CLRB    3(R0)           ;CLEAR HI BYTE OF PSW FOR RCV. VECTOR.
4126  021110  105060  000007                  CLRB    7(R0)           ;CLEAR HI BYTE OF PSW FOR XMIT. VECTOR.
4127                                                                  ;THIS WILL ENSURE THAT WE DON'T PICK
4128                                                                  ;UP ANY UNEXPECTED BITS IN PROCESSORS
4129                                                                  ;WHICH USE BITS 11-15 OF THE PSW.  IE
4130                                                                  ;IF BIT 11 IS SET IN AN 11/70 ANOTHER
4131                                                                  ;REGISTER SET MAY BE USED.
4132  021114  062737  000004  002230          ADD     #4,DMTVEC       ;ADJUST XMIT VECTOR
4133
4134                                                                  ;SET UP ISRS FOR DMR. INTERRUPTS ENABLED IN
4135                                                                  ;TESTS 15-19.
4136
4137  021122                                  SETVEC  DMRVEC,#INISR,#PRIO5    ;INPUT ISR
4138  021122  012746  000240                                                  MOV     #PRIO5,-(SP)
4139  021126  012746  022064                                                  MOV     #INISR,-(SP)
4140  021132  013746  002226                                                  MOV     DMRVEC,-(SP)
4141  021136  012746  000003                                                  MOV     #3,-(SP)
4142  021142  104437                                                          TRAP    C$SVEC
4143  021144  062706  000010                                                  ADD     #10,SP
4144  021150                                  SETVEC  DMTVEC,#OUTISR,#PRIO5   ;OUTPUT ISR
4145  021150  012746  000240                                                  MOV     #PRIO5,-(SP)
4146  021154  012746  023142                                                  MOV     #OUTISR,-(SP)
4147  021160  013746  002230                                                  MOV     DMTVEC,-(SP)
4148  021164  012746  000003                                                  MOV     #3,-(SP)
4149  021170  104437                                                          TRAP    C$SVEC
4150  021172  062706  000010                                                  ADD     #10,SP
4151
4152  021176  062701  000014                  ADD     #14,R1          ;INCR. P-TABLE POINTER.
4153  021202  012137  002254                  MOV     (R1)+,DMTURN    ;TURNAROUND
4154
4155
4156  021206  013700  002224                  MOV     SPEED,R0        ;GET THE SOFTWARE P-TABLE VALUE GIVEN
4157                                                                  ;BY THE USER
4158
4159
4160 .021212                          13$:
4161  021212  012701  000002                  MOV     #2,R1           ;GET FIRST TIMER VALUE
4162  021216  012702  000012                  MOV     #10.,R2         ;GET SECOND TIMER VALUE
4163  021222                          14$:
4164  021222  006301                          ASL     R1              ; TIMER VALUES X 2
4165  021224  006302                          ASL     R2
4166  021226  005300                          DEC     R0              ; DEC SPEED VARIABLE
4167  021230  001374                          BNE     14$             ; CONTINUE UNTIL DONE INCREASING WAIT VALUES
4168
4169  021232  010137  002312                  MOV     R1,WAIT1        ;SAVE TIMER VALUE FOR $WAIT
4170  021236  006201                          ASR     R1              ;HALF THAT VALUE
4171  021240  006201                          ASR     R1              ;HALF IT AGAIN.
4172  021242  010137  002314                  MOV     R1,WAIT2        ;SAVE TIMER VALUE FOR $MSCLR AND $CLRQI
4173                                                                  ;SUBROUTINES.
4174  021246  010237  002316                  MOV     R2,WAIT3        ;TIMER VALUE FOR $INOUT SUBROUTINE.
4175
4176                                                                  ;CHECK TURNAROUND.
4177  021252  012737  000333  002304          MOV     #333,AX3        ;MASK FOR AX3-15 - BIT CLEARED WILL
```

```
4178
4179  021260  022737  000001  002254          CMP     #1,DMTURN       ;BE THE INTERFACE SELECTED.
4180  021266  001004                          BNE     20$             ;IS V.35 REQUESTED?
4181  021270  042737  000020  002304          BIC     #BIT4,AX3       ;IF NOT - CONTINUE
4182  021276  000427                          BR      30$             ;SELECT V.35
4183  021300                          20$:
4184  021300  022737  000002  002254          CMP     #2,DMTURN       ;IS INTEGRAL REQUESTED?
4185  021306  001004                          BNE     22$             ;IF NOT - CONTINUE.
4186  021310  042737  00001C  002304          BIC     #BIT3,AX3       ;SELECT INTEGRAL MODEM.
4187  021316  000417                          BR      30$
4188  021320                          22$:
4189  021320  022737  000003  002254          CMP     #3,DMTURN       ;IS EIA REQUESTED?
4190  021326  001004                          BNE     25$             ;IF NOT - CONTINUE.
4191  021330  042737  000100  002304          BIC     #BIT6,AX3       ;SELECT EIA(XYZ).
4192  021336  000407                          BR      30$
4193  021340                          25$:
4194  021340  022737  000004  002254          CMP     #4,DMTURN       ;IS RS422 REQUESTED?
4195  021346  001007                          BNE     35$             ;IF NOT, DON'T ALLOW INTERFACE CHANGE.
4196  021350  042737  000200  002304          BIC     #BIT7,AX3       ;SELECT RS422.
4197  021356                          30$:
4198  021356  012737  000001  002262          MOV     #1,INFACE       ;SET FLAG THAT ALLOWS INTERFACE CHANGE.
4199  021364  000404                          BR      40$
4200  021366                          35$:
4201  021366  005037  002262                  CLR     INFACE          ,CLEAR FLAG - NO INTERFACE CHANGE.
4202  021372  005037  002304                  CLR     AX3             ;CLEAR AX3 BITS
4203  021376                          40$:
4204                                                                  ;*****************************************
4205  021376  005737  002310                  TST     MANUF           ;IS THIS A SPECIAL MANUFACTURING TEST CON.?
4206  021402  001410                          BEQ     42$             ;IF NOT - SET MAINT BIT ONLY FOR MODEM LOOP
4207                                                                  ;*****************************************
4208  021404  022737  000001  002254          CMP     #1,DMTURN       ;IS THIS V.35 WITH SPECIAL CONNECTOR?
4209  021412  001430                          BEQ     45$             ;IF YES - SET WRITE MAINT. BIT
4210  021414  022737  000003  002254          CMP     #3,DMTURN       ;IS THIS EIA WITH SPECIAL CONNECTOR?
4211  021422  001424                          BEQ     45$             ;IF YES - SET WRITE MAINT. BIT
4212  021424                          42$:
4213  021424  022737  000006  002254          CMP     #6,DMTURN       ;IS THIS LOCAL LOOP?
4214  021432  001420                          BEQ     45$             ;IF YES - SET WRITE MAINT. BIT.
4215  021434  022737  000007  002254          CMP     #7,DMTURN       ;IS THIS REMOTE LOOP?
4216  021442  001020                          BNE     50$             ;IF NOT - CLEAR MAINT. BIT FLAG
4217  021444  022737  000001  002270          CMP     #1,STARES       ;IS THIS THE FIRST PASS?
4218  021452  001010                          BNE     45$             ;IF NOT - SKIP MESSAGE
4219  021454                                  PRINTB  #FINIT3         ;WARN TO USE ONLY TESTS 17-19
4220  021454  012746  021670                                                  MOV     #FINIT3,-(SP)
4221  021460  012746  000001                                                  MOV     #1,-(SP)
4222  021464  010600                                                          MOV     SP,R0
4223  021466  104414                                                          TRAP    C$PNTB
4224  021470  062706  000004                                                  ADD     #4,SP
4225
4226  021474                          45$:
4227  021474  012737  000001  002306          MOV     #1,WMAINT       ;SET FLAG TO WRITE MODEM MAINTENANCE BITS.
4228  021502  000402                          BR      END
4229  021504                          50$:
4230  021504  005037  002306                  CLR     WMAINT          ;CLEAR FLAG - DON'T WRITE MAINT. 1 OR 2.
4231  021510                          END:
4232  021510                          ENDINIT
4233  021510                                                                  L10014:
```

```
                                                                                                    TRAP    C$INIT
4234  021510  104411
4235  021512  040445  025052  053440  FINIT1: .ASCIZ  /%A** WARNING - WILL ASSUME ADDRESS %06%A (NOT %06%A)%N/
4236  021520  051101  044516  043516
4237  021526  026440  053440  046111
4238  021534  020114  051501  052523
4239  021542  042515  040440  042104
4240  021550  042522  051523  022440
4241  021556  033117  040445  024040
4242  021564  047516  020124  047445
4243  021572  022466  024501  047045
4244  021600     000
4245  021601     045  025101  020052  FINIT2: .ASCIZ  /%A** WARNING - WILL ASSUME VECTOR  %03%A (NOT %03%A)%N/
4246  021606  040527  047122  047111
4247  021614  020107  020055  044527
4248  021622  046114  040440  051523
4249  021630  046525  020105  042526
4250  021636  052103  051117  020040
4251  021644  047445  022463  020101
4252  021652  047050  052117  022440
4253  021660  031517  040445  022451
4254  021666  000116
4255  021670  040445  025052  053440  FINIT3: .ASCIZ  /%A** WITH REMOTE LOOPBACK USE TESTS 17 - 19 ONLY **%N/
4256  021676  052111  020110  042522
4257  021704  047515  042524  046040
4258  021712  047517  041120  041501
4259  021720  020113  051525  020105
4260  021726  042524  052123  020123
4261  021734  033461  026440  030440
4262  021742  020071  047117  054514
4263  021750  025040  022452  000116
4264                                  .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.
                                ;////////////////////////////////////////////////////////////////////////

021756                          BGNAUTO
021756                                                                  L$AUTO::

                                        SETVEC  #4,#NOXMEM,#PRI07 ;SET UP NON -EXISTENT MEMORY TRAP VECTOR.
021756  012746  000340                                                          MOV     #PRI07,-(SP)
021762  012746  023630                                                          MOV     #NOXMEM,-(SP)
021766  012746  000004                                                          MOV     #4,-(SP)
021772  012746  000003                                                          MOV     #3,-(SP)
021776  104437                                                                  TRAP    C$SVEC
022000  062706  000010                                                          ADD     #10,SP
022004  005037  002352                CLR     NXMFLG          ;CLEAR FLAG THAT WILL BE SET IF NXM OCCURS.
022010  005777  160216                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.
                                ;;**************************************************************************

022014                                  CLRVEC  #4              ;RETURN VECTOR 04 TO NORMAL STATE
022014  012700  000004                                                          MOV     #4,R0
022020  104436                                                                  TRAP    C$CVEC
022022  005737  002352                TST     NXMFLG          ;DID NXM OCCUR?
022026  001406                        BEQ     1$              ;IF NOT EXIT
022030                                  DODU    LOGDEV          ;DROP THE DEVICE
022030  013700  002370                                                  MOV     LOGDEV,R0
022034  104451                                                          TRAP    C$DODU
022036                                  DOCLN                   ;DO CLEAN UP - FORCE BACK TO INIT CODE.
022036  104444                                                          TRAP    C$DCLN
022040  005037  002352                CLR     NXMFLG          ;RESTORE FLAG.
022044                          1$:
022044                          ENDAUTO
022044                                                                  L10015:
022044  104461                                                          TRAP    C$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
                                ;////////////////////////////////////////////////////////////////////////

022046                          BGNCLN
022046                                                                  L$CLEAN::

022046  005737  002352                TST     NXMFLG          ;WAS THERE A NXM ERROR?
022052  001003                        BNE     10$             ;IF YES - SKIP MASTER CLEAR.
022054  012777  040000  160150        MOV     #MCLR,@SEL0     ;ISSUE A MASTER CLEAR.
022062                          10$:

022062                          ENDCLN
022062                                                                  L10016:
022062  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.
                                ;////////////////////////////////////////////////////////////////

022064                          BGNSRV  INISR                   ;INPUT INTERRUPT SERVICE ROUTINE
022064                                                                          INISR::
022064  010046                        MOV     R0,-(SP)        ;SAVE R0
022066  010146                        MOV     R1,-(SP)        ;SAVE R1
022070  017701  160136                MOV     @SEL0,R1        ;SAVE THE CONTROL IN COMMAND.
022074  042701  177760                BIC     #177760,R1      ;CLEAR ALL BUT THE COMMAND BITS (0-3)
022100  032777  000200  160124        BIT     #RDI,@SEL0      ;IS RDI SET
022106  001002                        BNE     1$              ;IF YES - PROCESS INPUT COMMAND.
022110  000137  022620                JMP     NEXT            ;ISSUE NEXT INPUT COMMAND.
                                ;*****************************************************************
                                ;
                                ; PROCESS INPUT COMMAND
                                ;
                                ;*****************************************************************
022114                          1$:
022114  022701  000004                CMP     #BACCR,R1       ;IS THIS A RCV. BA/CC?
022120  001533                        BEQ     29$             ;BR IF YES.
022122  022701  000000                CMP     #BACCT,R1       ;IS THIS A XMIT. BA/CC?
022126  001537                        BEQ     30$             ;BR IF YES.
022130  022701  000003                CMP     #BASEI,R1       ;IS THIS A BASE IN?
022134  001461                        BEQ     20$             ;BR IF YES.
022136  022701  000001                CMP     #CNTRL,R1       ;IS THIS A CONTROL IN?
022142  001444                        BEQ     15$             ;BR IF YES.
022144  022701  000005                CMP     #WMODEM,R1      ;IS THIS A WRITE MODEM?
022150  001417                        BEQ     10$             ;BR IF YES.
022152  022701  000015                CMP     #INTER,R1       ;IS THIS AN INTERFACE WRITE.
022156  001410                        BEQ     5$              ;BR IF YES.
022160  022701  000002                CMP     #HLT,R1         ;IS THIS A HALT?
022164  001572                        BEQ     70$             ;EXIT - IF YES (NOTHING TO SET UP)
022166                                ERRDF   17,EMG17,ERRG2  ;PROBLEM IF IT'S NOT ONE OF THE ABOVE.
022166  104455                                                                    TRAP    C$ERDF
022170  000021                                                                    .WORD   17
022172  020301                                                                    .WORD   EMG17
022174  015124                                                                    .WORD   ERRG2
022176  000565                        BR      70$             ;EXIT

022200                          5$:
                                ;
                                ; WRITE AX3-15
                                ;
022200  113777  002304  160042        MOVB    AX3,@BSEL7      ;WRITE NECESSARY AX3-15 INTERFACE.
                                                                ;AX3 HAS BEEN DETERMINED IN THE INIT
                                                                ;CODE.
022206  000561                        BR      70$

022210                          10$:
                                ;
```

```
                                                        ; MODEM WRITE
                                                        ;
022210  022737  000006  002254                          CMP     #LLOOP,DMTURN   ;IS LOCAL MODEM LOOPBACK DESIRED?
022216  001007                                          BNE     11$             ;BR IF NOT
022220  042777  000004  160012                          BIC     #MAINT2,@SEL6   ;ENSURE REMOTE LOOPBACK IS CLEAR.
022226  052777  000110  160004                          BIS     #DTR.MAINT1,@SEL6 ;SET MAINTENANCE 1 BIT AND DTR.
022234  000546                                          BR      70$
022236                                          11$:
022236  042777  000010  157774                          BIC     #MAINT1,@SEL6   ;ENSURE LOCAL LOOPBACK IS CLEAR.
022244  052777  000104  157766                          BIS     #DTR!MAINT2,@SEL6 ;SET MAINTENANCE 2 BIT AND DTR.
022252  000537                                          BR      70$             ;CLEAR RQI
022254                                          15$:
                                                        ;
                                                        ;CONTROL IN
                                                        ;
022254  005737  002300                                  TST     MNTMDE          ;IS MAINTENANCE MODE REQUESTED
022260  001404                                          BEQ     17$             ;BR IF NOT
022262  012777  000400  157750                          MOV     #MAINT,@SEL6    ;REQUEST MAINT. MODE
022270  000530                                          BR      70$
022272                                          17$:
022272  005077  157742                                  CLR     @SEL6           ;FULL DUPLEX - NON-MAINT. MODE.
022276  000525                                          BR      70$
022300                                          20$:
                                                        ;
                                                        ;BASE IN
                                                        ;
022300  012777  002640  157730                          MOV     #BASE,@SEL4     ;BASE TABLE ADDRESS.

022306  005737  002276                                  TST     DMCMDE          ;ARE WE IN DMC MODE?
022312  001004                                          BNE     22$             ;BR IF YES
022314  012777  000522  157716                          MOV     #DMR,@SEL6      ;DMR MODE.
022322  000402                                          BR      23$             ;CHECK LOOPBACK.
022324                                          22$:
022324  005077  157710                                  CLR     @SEL6           ;DMC MODE
022330                                          23$:
022330  005737  002272                                  TST     START           ;IS THIS THE FIRST BASE IN?
022334  001004                                          BNE     24$             ;IF NOT - SET RESUME.
022336  052777  000100  157670                          BIS     #IEO,@SEL2      ;ON FIRST BASE IN SET RDO INT.ENABLE.
022344  000406                                          BR      25$
022346                                          24$:
022346  052777  010000  157664                          BIS     #RES,@SEL6      ;SET RESUME
022354  012737  177777  002360                          MOV     #-1,RESFLG      ;FLAG THAT THIS IS A BASE IN RESUME COMMAND
                                                        ;(THIS WILL BE USED LATER IN THIS ISR TO
                                                        ;DECIDE WHAT THE NEXT COMMAND WILL BE)
022362                                          25$:
022362  005737  002254                                  TST     DMTURN          ;IS INTERNAL LOOPACK REQUESTED?
022366  001004                                          BNE     27$             ;BR IF NOT - CLEAR LU LOOP
022370  052777  004000  157634                          BIS     #LPLU,@SEL0     ;SET THE LINE UNIT LOOPBACK BIT
022376  000465                                          BR      70$             ;CLEAR RQI AND EXIT.
022400                                          27$:
022400  042777  004000  157624                          BIC     #LPLU,@SEL0     ;CLEAR LINE UNIT LOOPBACK (CONNECTOR OR
                                                        ;CABLE)
022406  000461                                          BR      70$             ;CLEAR RQI AND EXIT

                                                        ;
                                                        ;BA/CC IN RCV
```

```
4448                                            ;
4449  022410                                29$:
4450  022410  005337  002326                    DEC     INRCV           ;DECREMENT COUNTER
4451  022414  012277  157616                    MOV     (R2)+,@SEL4     ;RCV BUFFER ADDRESS
4452  022420  012277  157614                    MOV     (R2)+,@SEL6     ;RCV CHARACTER COUNT
4453  022424  000406                            BR      40$
4454                                            ;
4455                                            ;BA/CC IN XMIT
4456                                            ;
4457  022426                                30$:
4458  022426  005337  002330                    DEC     INXMIT          ;DECREMENT COUNTER
4459  022432  012377  157600                    MOV     (R3)+,@SEL4     ;XMIT BUFFER ADDRESS.
4460  022436  012377  157576                    MOV     (R3)+,@SEL6     ;XMIT CHARACTER COUNT.
4461  022442                                40$:
4462  022442  005737  002302                    TST     MMANAG          ;ARE THE BUFFERS MEMORY MANAGED?
4463  022446  001441                            BEQ     70$             ;IF NOT SKIP CONVERTING VIRTUAL ADDR
4464                                                                    ;TO PHYSICAL ADDR.
4465  022450  052777  040000  157562            BIS     #BIT14,@SEL6    ;SET BIT 16 OF PHSICAL ADDRESS (I.E.
4466                                                                    ;VIRTUAL ADDR 60000 = PHYSICAL ADDR 200000
4467  022456  010246                            MOV     R2,-(SP)        ;SAVE R2 (NEXT RCV BUFFER ADDRESS)
4468  022460  017702  157552                    MOV     @SEL4,R2        ;SAVE THE VIRTUAL ADDRESS.
4469  022464  042777  160000  157544            BIC     #160000,@SEL4   ;CLEAR BITS CORRESPONDING TO THE PAGE #
4470                                                                    ;IN THE VIRTUAL ADDRESS.
4471  022472  042702  017777                    BIC     #17777,R2       ;SAVE ONLY THE PAGE # IN THE SAVED ADDR.
4472  022476  022702  060000                    CMP     #60000,R2       ;IS THIS PAGE 3?
4473  022502  001421                            BEQ     44$             ;IF YES, PHYSICAL ADDRESS CALCULATED
4474  022504  022702  100000                    CMP     #100000,R2      ;IS THIS PAGE 4?
4475  022510  001004                            BNE     41$             ;IF NOT SEE IF IT'S PAGE 4 OR 5
4476  022512  052777  020000  157516            BIS     #BIT13,@SEL4    ;SET BIT FOR PHYSICAL ADDR (I.E. VIRTUAL
4477                                                                    ;ADDR 100000 = PHYSICAL ADDR. 220000
4478  022520  000412                            BR      44$
4479  022522                                41$:
4480  022522  022702  120000                    CMP     #120000,R2      ;IS THIS PAGE 4?
4481  022526  001004                            BNE     42$             ;IF NOT, MUST BE PAGE 5.
4482  022530  052777  040000  157500            BIS     #BIT14,@SEL4    ;SET BIT FOR PHYSICAL ADDR (I.E. VIRTUAL
4483                                                                    ;ADDR 120000 = PHYSICAL ADDR. 240000
4484  022536  000403                            BR      44$
4485  022540                                42$:
4486  022540  052777  060000  157470            BIS     #BIT14!BIT13,@SEL4 ;SET BIT FOR PHYSICAL ADDR (I.E. VIRTUAL
4487                                                                    ;ADDR 140000 = PHYSICAL ADDR. 260000
4488  022546                                44$:
4489  022546  012602                            MOV     (SP)+,R2        ;RESTORE R2 (NEXT RCV BUFFER ADDRESS)
4490  022550  000400                            BR      70$             ;CLEAR RQI AND EXIT
4491
4492
4493  022552                                70$:
4494  022552  010137  002364                    MOV     R1,LAST         ;SAVE THE INPUT COMMAND (USED
4495                                                                    ;TO DETERMINE NEXT INPUT COMMAND)
4496  022556  005737  002276                    TST     DMCMDE          ;ARE WE IN DMC MODE?
4497  022562  001011                            BNE     80$             ;IF YES - DON'T USE IECLR
4498                                                                    ;NOTE: INTERRUPT CAPABILITY FOR RQI
4499                                                                    ;CLEAR IS ONLY AVAILABLE IN DMR MODE.
4500  022564  012601                            MOV     (SP)+,R1        ;RESTORE R1
4501  022566  012600                            MOV     (SP)+,R0        ;RESTORE R0
4502  022570  052777  000020  157434            BIS     #IECLR,@SEL0    ;SET INTERRUPT ENABLE FOR RDI CLEAR.
4503  022576  042777  000040  157426            BIC     #RQI,@SEL0      ;CLEAR RQI - INT. GENERATED WHEN RDI
```

```
4504
4505  022604  000002                          RTI                     ;CLEARS IN RESPONSE.
                                                                      ;RETURN AND WAIT FOR RQI CLEAR INTERRUPT.
4506
4507  022606                          80$:
4508  022606  042777  000020  157416          BIC     #IECLR,@SEL0    ;ENSURE INTERRUPT ENABLE FOR RDI CLEAR IS CLR.
4509  022614                                  CALL    $CLRQI          ;CLEAR RQI AND WAIT FOR RDI TO CLEAR.
4510                                          ;************************************ ***************************************
4511                                          ;
4512                                          ; RDI CLEAR - DETERMINE NEXT INPUT COMMAND.
4513                                          ;
4514                                          ;*****************************************************************************
4515  022620                          NEXT:
4516  022620  022737  000002  002364          CMP     #HLT,LAST       ;WAS THE LAST COMMAND A HALT?
4517  022626  001011                          BNE     110$            ;IF NOT - PROCEED.
4518  022630  005737  002274                  TST     RESUME          ;ARE WE TESTING RESUME?
4519  022634  001537                          BEQ     170$            ;IF NOT, DON'T ISSUE ANOTHER COMMAND.
4520  022636  005737  002354                  TST     INFLAG          ;INPUT BUFFER DONE?
4521  022642  001403                          BEQ     110$            ;IF NOT, PROCEED.
4522  022644  005737  002356                  TST     OUTFLG          ;OUTPUT BUFFER DONE?
4523  022650  001131                          BNE     170$            ;IF YES, DON'T ISSUE ANOTHER COMMAND.
4524  022652                          110$:
4525  022652  005737  002276                  TST     DMCMDE          ;ARE WE IN DMC MODE?
4526  022656  001404                          BEQ     111$            ;IF NOT (DMR MODE) - CHECK INTERFACE.
4527  022660  005737  002272                  TST     START           ;HAVE WE DONE A CONTROL IN?
4528  022664  001434                          BEQ     130$            ;IF NOT, DO IT.
4529  022666  000441                          BR      150$            ;OTHERWISE - KEEP CHECKING ON NEXT COMMAND.
4530  022670                          111$:
4531  022670  022737  000003  002364          CMP     #BASEI,LAST     ;WAS THE LAST COMMAND A BASE IN ?
4532  022676  001411                          BEQ     115$            ;IF YES - SEE IF INTER. OR M. WRITE IS NEEDED?
4533  022700  022737  000015  002364          CMP     #INTER,LAST     ;WAS THE LAST COMMAND AN AX3-15 WRITE?
4534  022706  001414                          BEQ     117$            ;IF YES - CHECK FOR MODEM WRITE.
4535  022710  022737  000005  002364          CMP     #WMODEM,LAST    ;WAS THE LAST COMMAND A WRITE MODEM.
4536  022716  001417                          BEQ     130$            ;IF YES - ISSUE A CONTROL IN.
4537  022720  000424                          BR      150$            ;KEEP CHECKING FOR NEXT COMMAND.
4538  022722                          115$:
4539  022722  005737  002262                  TST     INFACE          ;IS AN AX3-15 WRITE NEEDED?
4540  022726  001404                          BEQ     117$            ;BR IF NOT
4541  022730  112777  000155  157274          MOVB    #IESET!RQI!INTER,@BSEL0 ;ISSUE AN AX3-15 WRITE COMMAND.
4542  022736  000476                          BR      170$
4543  022740                          117$:
4544  022740  005737  002306                  TST     WMAINT          ;WRITE MAINT 1 OR 2?
4545  022744  001404                          BEQ     130$            ;IF NOT - SKIP WRITE MODEM COMMAND.
4546  022746  112777  000145  157256          MOVB    #IESET!RQI!WMODEM,@BSEL0 ;ISSUE A MODEM WRITE COMMAND
4547  022754  000467                          BR      170$
4548  022756                          130$:
4549  022756  005237  002272                  INC     START           ;SET FLAG THAT CONTROL IN WAS ISSUED.
4550  022762  112777  000141  157242          MOVB    #IESET!RQI!CNTRL,@BSEL0 ;ISSUE A CONTROL IN
4551  022770  000461                          BR      170$
4552  022772                          150$:
4553  022772  005737  002326                  TST     INRCV           ;ARE ALL THE BA/CC IN RCVS DONE?
4554  022776  001424                          BEQ     160$            ;IF YES - BR TO SEE IF XMITS DONE.
4555  023000  005737  002274                  TST     RESUME          ;IS A TEST OF RESUME REQUESTED?
4556  023004  001415                          BEQ     153$            ;BR IF NOT.
4557  023006  032737  000001  002326          BIT     #BIT0,INRCV     ;IS THIS AN ODD COUNT?
4558  023014  001411                          BEQ     153$            ;BR IF NOT.
4559  023016  005737  002360                  TST     RESFLG          ;WAS THE LAST COMMAND A BASE IN RESUME?
```

```
4560  023022  001004                          BNE     152$            ;IF YES, ISSUE BA/CC
4561                                                                  ;HALT - TO TEST RESUME.  NOTE: THIS WILL
4562                                                                  ;OCCUR ONLY WHEN RESUME IS REQUESTED,
4563                                                                  ;FOLLOWING EVERY OTHER BA/CC
4564                                                                  ;COMMAND  (NEVER FOLLOWING A RESUME)
4565  023024  112777  000142  157200              MOVB    #IESET!RQI!HLT,@BSEL0 ;HALT IT
4566  023032  000440                          BR      170$
4567  023034                          152$:
4568  023034  005037  002360                  CLR     RESFLG          ;CLEAR FLAG.
4569  023040                          153$:
4570  023040  112777  000144  157164              MOVB    #IESET!RQI!BACCR,@BSEL0 ;ISSUE A BA/CC IN RCV. COMMAND.
4571  023046  000432                          BR      170$
4572  023050                          160$:
4573  023050  005737  002330                  TST     INXMIT          ;ARE ALL THE BA/CC IN XMITS DONE?
4574  023054  001424                          BEQ     165$            ;IF YES, SET THE FLAG
4575  023056  005737  002274                  TST     RESUME          ;IS A TEST OF RESUME REQUESTED?
4576  023062  001415                          BEQ     163$            ;BR IF NOT.
4577  023064  032737  000001  002330          BIT     #BIT0,INXMIT    ;IS THIS AN ODD COUNT?
4578  023072  001411                          BEQ     163$            ;BR IF NOT.
4579  023074  005737  002360                  TST     RESFLG          ;WAS THE LAST COMMAND A BASE IN RESUME?
4580  023100  001004                          BNE     162$            ;IF YES, ISSUE BA/CC
4581                                                                  ;HALT - TO TEST RESUME.  NOTE: THIS WILL
4582                                                                  ;OCCUR ONLY WHEN RESUME IS REQUESTED,
4583                                                                  ;FOLLOWING EVERY OTHER BA/CC
4584                                                                  ;COMMAND  (NEVER FOLLOWING A RESUME)
4585  023102  112777  000142  157122              MOVB    #IESET!RQI!HLT,@BSEL0 ;HALT IT
4586  023110  000411                          BR      170$
4587  023112                          162$:
4588  023112  005037  002360                  CLR     RESFLG          ;CLEAR BASE IN RESUME FLAG.
4589  023116                          163$:
4590  023116  112777  000140  157106              MOVB    #IESET!RQI!BACCT,@BSEL0 ;ISSUE A BA/CC IN XMIT COMMAND.
4591  023124  000403                          BR      170$
4592  023126                          165$:
4593  023126  012737  177777  002354              MOV     #-1,INFLAG      ;FLAG THAT ALL BA/CC INS DONE.
4594
4595  023134                          170$:
4596  023134  012601                          MOV     (SP)+,R1        ;RESTORE R1
4597  023136  012600                          MOV     (SP)+,R0        ;RESTORE R0
4598
4599  023140                          ENDSRV
4600  023140                                                                          L10017:
4601  023140  000002                                                                         RTI
4602
4603                                  ;*****************************************************************************
4604                                  ;*****************************************************************************
4605
4606  023142                          BGNSRV  OUTISR                  ;OUTPUT INTERRUPT SERVICE ROUTINE
4607  023142                                                                          OUTISR::
4608  023142  010046                          MOV     R0,-(SP)        ;SAVE R0
4609  023144  032777  000200  157062          BIT     #RDO,@SEL2      ;IS THE RDO OUT BIT SET?
4610  023152  001006                          BNE     5$              ;IF YES - OK TO PROCEED.
4611                                                                  ;OTHERWISE REPORT SPURIOUS INTERRUPT
4612  023154                                  ERRDF   18,EMG18,ERRG2
4613  023154  104455                                                                  TRAP    C$ERDF
4614  023156  000022                                                                  .WORD   18
4615  023160  020353                                                                  .WORD   EMG18
```

```
                                                                                    .WORD   ERRG2
                        JMP     60$
5$:
                        BIT     #CNTRL,@SEL2    ;IS THIS A CONTROL OUT
                        BEQ     20$             ;IF NOT - PROCESS BA/CC OUT
                        BIT     #HALTC,@SEL6    ;IS THIS CONTROL OUT A HALT?
                        BNE     10$             ;IF IT IS - SEE IF WE SHOULD RESUME.
                        BIT     #DMRRUN,@SEL6   ;IS THIS DMR RUN MODE ACKNOWLEDGE?
                        BEQ     10$             ;IF NOT - REPORT ERROR
                        JMP     65$             ;EXIT
7$:
                        ERRDF   9,EMG9,ERRG2    ;UNEXPECTED CONTROL OUT.
                                                                            TRAP    C$ERDF
                                                                            .WORD   9
                                                                            .WORD   EMG9
                                                                            .WORD   ERRG2
                        BR      65$             ;EXIT ROUTINE
10$:
                        TST     INFLAG          ;ARE THE INPUTS DONE?
                        BEQ     15$             ;BR IF NOT
                        TST     OUTFLG          ;ARE THE OUTPUTS DONE?
                        BNE     60$             ;IF YES - ALL DONE, EXIT
15$:
                        TST     RESUME          ;IS A RESUME REQUESTED?
                        BEQ     16$             ;IF NOT - BRANCH TO ERROR.
                        MOV     #MCLR,@SEL0     ;ISSUE A MASTER CLEAR.
                        NOP
                        NOP
                        BIS     #IEO,@SEL2      ;RESET INTERRUPT ENABLE (MASTER
                                                ;CLEAR - CLEARS ALL BITS)
                        MOVB    #IESET!RQI!BASEI,@SEL0  ;ISSUE A BASE IN
                        BR      65$             ;BRANCH OUT.

16$:
                        ERRDF   16,EMG16        ;ERROR - UNEXPECTED HALT.
                                                                            TRAP    C$ERDF
                                                                            .WORD   16
                                                                            .WORD   EMG16
                                                                            .WORD   0
                        JMP     60$
20$:
                        TST     MMANAG          ;ARE THE BUFFERS MEMORY MANAGED?
                        BEQ     40$             ;IF NOT - NO NEED TO DETERMINE PHYS. ADDR.
                        BIT     #BIT14,@SEL6    ;IS BIT 16 OF THE PHYSICAL ADDR SET?
                                                ;(I.E. BUFFER SHOULD BE IN PHYSICAL
                                                ;ADDRESS RANGE: 200000 - 277776)
                        BNE     21$             ;PROCEED - IF BIT SET.
                        ERRDF   11,EMG11,ERRG2
                                                                            TRAP    C$ERDF
                                                                            .WORD   11
                                                                            .WORD   EMG11
                                                                            .WORD   ERRG2
                        BR      60$
21$:
                        BIC     #BIT15!BIT14,@SEL6 ;CLEAR THE EXTENDED ADDRESS BITS.
                        MOV     @SEL4,R2        ;SAVE BITS 0-15 OF THE PHYSICAL ADDRESS.
```

```
 4672  023366  042702  017777              BIC     #17777,R2       ;SAVE ONLY PAGE ADDRESS BITS.
 4673  023372  042777  160000  156636      BIC     #160000,@SEL4   ;CLEAR PAGE ADDRESS BITS IN SEL4
 4674                                                              ;DETERMINE PAGE # FOR VIRTUAL ADDRESS.
 4675  023400  005702                      TST     R2              ;IS THIS PAGE 3?
 4676  023402  001004                      BNE     22$             ;IF NOT CHECK FOR OTHER PAGES
 4677  023404  052777  060000  156624      BIS     #60000,@SEL4    ;SET BITS FOR PAGE 3.
 4678  023412  000421                      BR      40$
 4679  023414                          22$:
 4680  023414  022702  020000              CMP     #20000,R2       ;IS THIS PAGE 4?
 4681  023420  001004                      BNE     23$             ;IF NOT - KEEP CHECKING
 4682  023422  052777  100000  156606      BIS     #100000,@SEL4   ;SET BITS FOR PAGE 4.
 4683  023430  000412                      BR      40$
 4684  023432                          23$:
 4685  023432  022702  040000              CMP     #40000,R2       ;IS THIS PAGE 5?
 4686  023436  001004                      BNE     24$             ;IF NOT - MUST BE PAGE 6
 4687  023440  052777  120000  156570      BIS     #120000,@SEL4   ;SET BITS FOR PAGE 5.
 4688  023446  000403                      BR      40$
 4689  023450                          24$:
 4690  023450  052777  140000  156560      BIS     #140000,@SEL4   ;SET BITS FOR PAGE 6.
 4691  023456                          40$:
 4692  023456  032777  000004  156550      BIT     #RCV,@SEL2      ;IS THIS A RECV. BUFFER?
 4693  023464  001023                      BNE     50$             ;IF YES - PROCESS THE BUFFER.
 4694  023466  005337  002334              DEC     OUTXMT          ;DECREMENT BA/CC OUT XMIT.
 4695  023472  022577  156540              CMP     (R5)+,@SEL4     ;IS THE XMIT BUFFER ADDRESS CORRECT?
 4696  023476  001406                      BEQ     41$             ;IF YES - PROCEED.
 4697  023500  005725                      TST     (R5)+           ;INCR. POINTER FOR ERROR MESSAGE.
 4698  023502                              ERRDF   11,EMG11,ERRG8  ;IF NOT - ERROR
 4699  023502  104455                                                      TRAP    C$ERDF
 4700  023504  000013                                                      .WORD   11
 4701  023506  020116                                                      .WORD   EMG11
 4702  023510  016062                                                      .WORD   ERRG8
 4703  023512  000425                      BR      60$             ;EXIT ROUTINE
 4704  023514                          41$:
 4705  023514  022577  156520              CMP     (R5)+,@SEL6     ;IS THE CHAR. COUNT CORRECT?
 4706  023520  001422                      BEQ     60$             ;IF OK - EXIT ROUTINE.
 4707  023522                              ERRDF   12,EMG12,ERRG8  ;IF NOT - ERROR
 4708  023522  104455                                                      TRAP    C$ERDF
 4709  023524  000014                                                      .WORD   12
 4710  023526  020141                                                      .WORD   EMG12
 4711  023530  016062                                                      .WORD   ERRG8
 4712  023532  000415                      BR      60$             ;EXIT
 4713  023534                          50$:
 4714  023534  005337  002332              DEC     OUTRCV          ;DECREMENT BA/CC OUT RCV
 4715  023540  022477  156472              CMP     (R4)+,@SEL4     ;IS THE RCV BUFFER ADDRESS CORRECT?
 4716  023544  001406                      BEQ     51$             ;IF OK - PROCEED
 4717  023546                              ERRDF   11,EMG11,ERRG7
 4718  023546  104455                                                      TRAP    C$ERDF
 4719  023550  000013                                                      .WORD   11
 4720  023552  020116                                                      .WORD   EMG11
 4721  023554  015764                                                      .WORD   ERRG7
 4722  023556  005724                      TST     (R4)+           ;UPDATE POINTER
 4723  023560  000402                      BR      60$             ;EXIT ROUTINE
 4724  023562                          51$:
 4725  023562  017724  156452              MOV     @SEL6,(R4)+     ;CHANGE THE CHARACTER COUNT TO WHAT
 4726                                                              ;WAS RECEIVED.
 4727  023566                          60$:
```

```
4728  023566  005737  002334          TST     OUTXMT          ;HAVE ALL THE XMITS BEEN DONE?
4729  023572  001011                  BNE     65$             ;IF NOT, CONTINUE
4730  023574  005737  002332          TST     OUTRCV          ;HAVE ALL THE RECEIVES BEEN DONE?
4731  023600  001006                  BNE     65$             ;IF NOT, CONTINUE
4732  023602                  61$:
4733  023602  042777  000100  156424  BIC     #IEO,@SEL2      ;CLEAR THE OUTPUT INTERRUPT
4734  023610  012737  177777  002356  MOV     #-1,OUTFLG      ;FLAG AS DONE.
4735  023616                  65$:
4736  023616  042777  000207  156410  BIC     #RDO!CMD,@SEL2  ;CLEAR THE RDO BIT.
4737  023624  012600                  MOV     (SP)+,R0        ;RESTORE R0
4738  023626                  ENDSRV
4739  023626                                                          L10020:
4740  023626  000002                                                         RTI
4741
4742                          ;*****************************************************************
4743                          ;*****************************************************************
4744
4745  023630                  BGNSRV  NOXMEM
4746  023630                                                          NOXMEM::
4747
4748  023630  012737  000001  002352  MOV     #1,NXMFLG       ;SET FLAG IF MEMORY ADDRESSED IS NON-EXISTENT.
4749
4750  023636                  ENDSRV
4751  023636                                                          L10021:
4752  023636  000002                                                         RTI
4753
4754
```

```
                                .SBTTL  DROP UNIT SECTION

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

023640                          BGNDU
023640                                                                  L$DU::
                        BRESET                  ;ISSUE UNIBUS RESET TO CLEAN UP
023640  104433                                                                  TRAP    C$RESET
                        PRINTF  #FMDROP,LOGDEV
023642  013746  002370                                                          MOV     LOGDEV,-(SP)
023646  012746  023670                                                          MOV     #FMDROP,-(SP)
023652  012746  000002                                                          MOV     #2,-(SP)
023656  010600                                                                  MOV     SP,R0
023660  104417                                                                  TRAP    C$PNTF
023662  062706  000006                                                          ADD     #6,SP

023666                          ENDDU
023666                                                                  L10022:
023666  104453                                                                  TRAP    C$DU

023670  047045  040445  047125  FMDROP: .ASCIZ  /%N%AUNIT %D2%A DROPPED/
023676  052111  022440  031104
023704  040445  042040  047522
023712  050120  042105     000
023720                          .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.
                        ;*************************************************************************
023720                  BGNTST
023720                                                          T1::

023720                          SETVEC  #4,#LOCATE,#PRI07 ;SET UP NON -EXISTENT MEMORY TRAP VECTOR.
023720  012746  000340                                                  MOV     #PRI07,-(SP)
023724  012746  024042                                                  MOV     #LOCATE,-(SP)
023730  012746  000004                                                  MOV     #4,-(SP)
023734  012746  000003                                                  MOV     #3,-(SP)
023740  104437                                                          TRAP    C$SVEC
023742  062706  000010                                                  ADD     #10,SP
023746  005037  002352          CLR     NXMFLG          ;FLAG USED IN THE TRAP ROUTINE.
023752  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
                        ;;*************************************************************************

023754  005777  156252          TST     @SEL0           ;TEST THE CSR AT 76XXX0
023760  012701  000002          MOV     #2,R1           ;SAVE THE OFFSET OF THE NEXT CSR
023764  005777  156244          TST     @SEL2           ;TEST THE CSR AT 76XXX2
023770  012701  000004          MOV     #4,R1           ;SAVE THE OFFSET OF THE NEXT CSR
023774  005777  156236          TST     @SEL4           ;TEST THE CSR AT 76XXX4
024000  012701  000006          MOV     #6,R1           ;SAVE THE OFFSET OF THE NEXT CSR
024004  005777  156230          TST     @SEL6           ;TEST THE CSR AT 76XXX6
024010  005737  002352          TST     NXMFLG          ;WAS THERE A TRAP?
024014  001406                  BEQ     10$             ;IF NOT - EXIT.
024016                          DODU    LOGDEV          ;DROP THE DEVICE
024016  013700  002370                                                  MOV     LOGDEV,R0
024022  104451                                                          TRAP    C$DODU
024024                          DOCLN                   ;DO CLEAN UP - FORCE BACK TO INIT CODE.
024024  104444                                                          TRAP    C$DCLN
024026  005037  002352          CLR     NXMFLG          ;RESTORE THE FLAG.
024032                  10$:
024032                          CLRVEC  #4              ;RETURN VECTOR 04 TO NORMAL STATE
024032  012700  000004                                                  MOV     #4,R0
```

```
4841  024036  104436                                                          TRAP    C$CVEC
4842
4843  024040                          ENDTST
4844  024040                                                          L10023:
4845  024040  104401                                                          TRAP    C$ETST
4846
4847
4848  024042                          BGNSRV  LOCATE                  ;INTERRUPT SERVICE ROUTINE
4849  024042                                                                  LOCATE::
4850  024042  010046                          MOV     R0,-(SP)        ;SAVE R0
4851  024044  005737  002352                  TST     NXMFLG          ;HAVE WE HAD AT LEAST 1 PREVIOUS TRAP?
4852  024050  001006                          BNE     10$             ;IF YES, DON'T BOTHER DECLARING ANOTHER
4853                                                                  ;DEVICE FATAL ERROR
4854  024052                                  ERRDF   6,EMT0          ;NON-EXISTENT DEVICE ERROR
4855  024052  104455                                                          TRAP    C$ERDF
4856  024054  000006                                                          .WORD   6
4857  024056  024120                                                          .WORD   EMT0
4858  024060  000000                                                          .WORD   0
4859  024062  005237  002352                  INC     NXMFLG          ;SET THE FLAG
4860  024066                          10$:
4861  024066                                  PRINTX  #FMT0,R1,CSR(R1) ;PRINT THE CSR THAT DOESN'T RESPOND.
4862  024066  016146  002232                                                  MOV     CSR(R1),-(SP)
4863  024072  010146                                                          MOV     R1,-(SP)
4864  024074  012746  024147                                                  MOV     #FMT0,-(SP)
4865  024100  012746  000003                                                  MOV     #3,-(SP)
4866  024104  010600                                                          MOV     SP,R0
4867  024106  104415                                                          TRAP    C$PNTX
4868  024110  062706  000010                                                  ADD     #10,SP
4869  024114  012600                          MOV     (SP)+,R0        ;RESTORE R0
4870  024116                          ENDSRV
4871  024116                                                          L10024:
4872  024116  000002                                                          RTI
4873
4874  024120  042101  051104  051505  EMT0:   .ASCIZ  /ADDRESS ERROR - TRAP 4/
4875  024126  020123  051105  047522
4876  024134  020122  020055  051124
4877  024142  050101  032040     000
4878  024147     045  031523  040445  FMT0:   .ASCIZ  /%S3%ACSR (SEL%D1%A) AT %O6%A DOES NOT RESPOND%N/
4879  024154  051503  020122  051450
4880  024162  046105  042045  022461
4881  024170  024501  040440  020124
4882  024176  047445  022466  020101
4883  024204  047504  051505  047040
4884  024212  052117  051040  051505
4885  024220  047520  042116  047045
4886  024226     000
4887          024230                  .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 #.
                        ;*
                        ;*******************************************************************************
024230                  BGNTST
024230                                                                          T2::
024230                    BGNSUB
024230                                                                          T2.1:
024230  104402                                                                          TRAP    C$BSUB
024232  022737  000001  002270          CMP     #1,STARES       ;IS THIS THE FIRST PASS?
024240  001061                          BNE     5$              ;IF NOT - SKIP THIS SUBROUTINE.
                                                                ;GET VERSION # FROM EACH ROM AND PRINT IT OUT
024242  005004                          CLR     R4              ;# OF THE 1ST ROM
024244  012705  000001                  MOV     #1,R5           ;# OF NEXT ROM
024250  012737  001774  002412          MOV     #1774,ROMADR    ;ADDRESS OF BYTE CONTAINING # IN ROMS 0 & 1
024256                                  PRINTB  #FMT1,LOGDEV    ;MICROCODE VERSION
024256  013746  002370                                                          MOV     LOGDEV,-(SP)
024262  012746  025204                                                          MOV     #FMT1,-(SP)
024266  012746  000002                                                          MOV     #2,-(SP)
024272  010600                                                                  MOV     SP,R0
024274  104414                                                                  TRAP    C$PNTB
024276  062706  000006                                                          ADD     #6,SP
024302                          1$:
024302                          CALL    $ROMO           ;GET ROM CONTENTS.
024306  117737  155726  025540  MOVB    @BSEL6,REV1     ;SAVE THE ASCII REVISION # OF THE ROM
024314  117737  155730  025542  MOVB    @BSEL7,REV2     ;SAVE THE REV. # OF THE NEXT ROM
                                                        ;PRINT
024322                          PRINTB  #FMT2,R4,#REV1,R5,#REV2
024322  012746  025542                                                          MOV     #REV2,-(SP)
```

```
                                                                                        MOV     R5,-(SP)
                                                                                        MOV     #REV1,-(SP)
                                                                                        MOV     R4,-(SP)
                                                                                        MOV     #FMT2,-(SP)
                                                                                        MOV     #5,-(SP)
                                                                                        MOV     SP,R0
                                                                                        TRAP    C$PNTB
                                                                                        ADD     #14,SP

                        CMP     #5,R5           ;ARE WE DONE?
                        BEQ     5$              ;IF YES - EXIT
                        ADD     #2,R4           ;INCR. ROM NUMBERS
                        ADD     #2,R5           ;
                        ADD     #2000,ROMADR    ;ADDRESS OF BYTES CONTAINING NEXT ROM REV #S.
                        BR      1$

                5$:
                  ENDSUB
                                                                                L10026:
                                                                                        TRAP    C$ESUB


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

                10$:
                        MOV     #-1,LOCRC       ;INITIALIZE CRC WORD FOR THE LOW BYTE
                                                ;CALCULATION.
                        MOV     #-1,HICRC       ;INIT. CRC WORD FOR THE HIGH BYTE.
                        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.
                                                ;

                20$:
                        CALL    $ROMO           ;GET THE ROM CONTENTS
                        MOVB    @BSEL6,LOWORD   ;SAVE THE LOW BYTE OF THE ROM CONTENTS.
                        MOVB    @BSEL7,HIWORD   ;SAVE THE HIGH BYTE OF THE ROM CONTENTS.
                        INC     ROMADR          ;INCREMENT THE ROM ADDRESS POINTER
                        CALL    $ROMO           ;GET THE CONTENTS OF THE NEXT ROM ADDRESS
                        MOVB    @BSEL6,LOWORD+1 ;SAVE THE NEXT LOW BYTE.
                        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.
                        INC     ROMADR          ;INCREMENT THE ROM ADDRESS POINTER
```

```
5000  024512  005301                        DEC     R1              ;ARE WE FINISHED WITH THESE 2 ROMS?
5001  024514  001443                        BEQ     40$             ;IF YES, CHECK CRC
5002                                        ;
5003                                        ; CRC/CCITT CALCULATION - CONVERT THE WORD (LOWORD & HIWORD) TO
5004                                        ;                         A SERIAL STREAM FOR CALCULATION.
5005                                        ;
5006  024516  012703  000020                MOV     #16.,R3         ;16 BITS TO CONSIDER
5007  024522                          25$:
5008  024522  000241                        CLC                     ;CLEAR THE CARRY
5009  024524  006037  002402                ROR     LOCRC           ;ROTATE BIT0 INTO THE CARRY BIT
5010  024530  006037  002406                ROR     LOWORD          ;ROTATE BIT0 INTO C AND THE OLD C INTO BIT15
5011                                                                ;ARE THE BITS 15 & BITS 0 THE SAME?
5012                                                                ;IF YES (V IS CLEAR), DON'T DO THE CRC
5013  024534  102011                        BVC     30$             ;NOTE: V IS THE EXCLUSIVE OR OF BIT0 & BIT15.
5014  024536  012702  102010                MOV     #102010,R2      ;CRC/CCITT POLYNOMIAL
5015  024542  043702  002402                BIC     LOCRC,R2
5016  024546  042737  102010  002402        BIC     #102010,LOCRC
5017  024554  050237  002402                BIS     R2,LOCRC
5018  024560                          30$:
5019  024560  000241                        CLC                     ;CLEAR THE CARRY
5020  024562  006037  002404                ROR     HICRC           ;ROTATE BIT 0 INTO C
5021  024566  006037  002410                ROR     HIWORD          ;ROTATE OLD C INTO BIT15 (SIGN) & BIT0 INTO C
5022                                                                ;ARE THE BITS 0 OF HICRC & HIWORD THE SAME?
5023  024572  102011                        BVC     35$             ;IF YES (V IS CLEAR), DON'T DO THE CRC.
5024                                                                ;NOTE: V IS THE EXCLUSIVE OR OF BIT0 & BIT15.
5025  024574  012702  102010                MOV     #102010,R2      ;CRC/CCITT POLYNOMIAL
5026  024600  043702  002404                BIC     HICRC,R2
5027  024604  042737  102010  002404        BIC     #102010,HICRC
5028  024612  050237  002404                BIS     R2,HICRC
5029  024616                          35$:
5030  024616  005303                        DEC     R3              ;DO ALL 16 BITS
5031  024620  001340                        BNE     25$
5032  024622  000707                        BR      20$             ;GET THE CONTENTS OF THE NEXT 2 ROM ADDRESSES.
5033  024624                          40$:
5034                                        ;
5035                                        ; AT THIS POINT WE'VE READ THE CONTENTS AND CALCULATED THE CRC FOR
5036                                        ; 2 ROM ROMS (ONE LOW BYTE & ONE HIGH BYTE).  ALSO WE'VE READ THE
5037                                        ; CRC BLASTED INTO THE LAST 2 BYTES OF THE ROM (IN LOWORD/HIWORD)
5038                                        ;
5039  024624  005137  002402                COM     LOCRC           ;COMPLEMENT THE CALCULATED CRC .
5040  024630  023737  002402  002406        CMP     LOCRC,LOWORD    ;IS THE CRC IN ROM THE SAME AS THE
5041                                                                ;CALCULATED CRC?
5042  024636  001427                        BEQ     50$             ;IF YES - CHECK THE HIGH BYTE CRC (NEXT ROM)
5043  024640  005737  002344                TST     FLAG            ;HAS AN ERRDF ALREADY BEEN DECLARED (REMEMBER
5044                                                                ;WE'RE IN A LOOP)
5045  024644  001007                        BNE     41$             ;IF YES, DON'T BOTHER WITH ANOTHER ERRDF.
5046  024646  012737  000001  002344        MOV     #1,FLAG         ;FLAG THAT ERRDF HAS BEEN DETECTED.
5047  024654                                ERRDF   7,EMT1          ;ROM ERROR
5048  024654  104455                                                                TRAP    C$ERDF
5049  024656  000007                                                                .WORD   7
5050  024660  025472                                                                .WORD   EMT1
5051  024662  000000                                                                .WORD   0
5052  024664                          41$:
5053  024664                                PRINTB  #FMT3,R4,LOCRC,LOWORD
5054  024664  013746  002406                                                       MOV     LOWORD,-(SP)
5055  024670  013746  002402                                                       MOV     LOCRC,-(SP)
```

```
5056  024674  010446                                                          MOV     R4,-(SP)
5057  024676  012746  025330                                                  MOV     #FMT3,-(SP)
5058  024702  012746  000004                                                  MOV     #4,-(SP)
5059  024706  010600                                                          MOV     SP,R0
5060  024710  104414                                                          TRAP    C$PNTB
5061  024712  062706  000012                                                  ADD     #12,SP
5062  024716                          50$:
5063  024716  005204                         INC     R4              ;INCR ROM #
5064  024720  005137  002404                 COM     HICRC           ;COMPLEMENT THE CALCULATED CRC FOR THE HI BYTE
5065  024724  023737  002404  002410         CMP     HICRC,HIWORD    ;ROM CRC AND CALCULATED CRC THE SAME?
5066  024732  001427                         BEQ     60$             ;IF YES - CHECK THE ROM LOCATIONS.
5067  024734  005737  002344                 TST     FLAG            ;HAS AN ERRDF ALREADY BEEN DECLARED (REMEMBER
5068                                                                  ;WE'RE IN A LOOP)
5069  024740  001007                         BNE     51$             ;IF YES, DON'T BOTHER WITH ANOTHER ERRDF.
5070  024742  012737  000001  002344         MOV     #1,FLAG         ;FLAG THAT ERRDF HAS BEEN DETECTED.
5071  024750                                 ERRDF   7,EMT1          ;ROM ERROR
5072  024750  104455                                                          TRAP    C$ERDF
5073  024752  000007                                                          .WORD   7
5074  024754  025472                                                          .WORD   EMT1
5075  024756  000000                                                          .WORD   0
5076  024760                          51$:
5077  024760                                 PRINTB  #FMT3,R4,HICRC,HIWORD
5078  024760  013746  002410                                                  MOV     HIWORD,-(SP)
5079  024764  013746  002404                                                  MOV     HICRC,-(SP)
5080  024770  010446                                                          MOV     R4,-(SP)
5081  024772  012746  025330                                                  MOV     #FMT3,-(SP)
5082  024776  012746  000004                                                  MOV     #4,-(SP)
5083  025002  010600                                                          MOV     SP,R0
5084  025004  104414                                                          TRAP    C$PNTB
5085  025006  062706  000012                                                  ADD     #12,SP
5086  025012                          60$:
5087  025012  022704  000005                 CMP     #5,R4           ;IF WE'VE DONE ROMS 0-5, WE'RE DONE.
5088  025016  001403                         BEQ     70$             ;EXIT WHEN DONE
5089  025020  005204                         INC     R4              ;CHECK THE NEXT ROM.
5090  025022  000137  024422                 JMP     10$
5091  025026                          70$:
5092
5093  025026                            ENDSUB
5094  025026                                                                L10027:
5095  025026  104403                                                                TRAP    C$ESUB
5096
5097  025030                            BGNSUB
5098  025030                                                                T2.3:
5099  025030  104402                                                                TRAP    C$BSUB
5100  025032  005037  002344                 CLR     FLAG            ;CLEAR FLAG
5101  025036  005004                         CLR     R4              ;BEGIN AT ROM 0
5102  025040  012737  001775  002412         MOV     #1775,ROMADR    ;ADDRESS OF BYTE CONTAINING ROM #
5103  025046                          10$:
5104  025046                                 CALL    $ROM0           ;GET ROM CONTENTS
5105  025052  117701  155162                 MOVB    @BSEL6,R1       ;SAVE THE CONTENTS OF THE LOW BYTE
5106                                                                  ;FOR ROMS 0,2,4
5107  025056  000402                         BR      17$
5108  025060                          15$:
5109  025060  117701  155164                 MOVB    @BSEL7,R1       ;SAVE THE CONTENTS OF THE HIGH BYTE
5110                                                                  ;FOR ROMS 1,3,5
5111  025064                          17$:
```

```
5112  025064  042701  177760            BIC     #^C17,R1        ;CONVERT THE ASCII BYTE TO AN OCTAL WORD.
5113  025070  020104                    CMP     R1,R4           ;IS THIS THE EXPECTED ROM #
5114  025072  001427                    BEQ     20$             ;IF YES - OK.
5115  025074  005737  002344            TST     FLAG            ;HAS AN ERRDF ALREADY BEEN DECLARED (REMEMBER
5116                                                            ;WE'RE IN A LOOP)
5117  025100  001007                    BNE     18$             ;IF YES, DON'T BOTHER WITH ANOTHER ERRDF.
5118  025102  012737  000001  002344    MOV     #1,FLAG         ;FLAG THAT ERRDF HAS BEEN DETECTED.
5119  025110                            ERRDF   7,EMT2          ;ROM ERROR
5120  025110  104455                                                            TRAP    C$ERDF
5121  025112  000007                                                           .WORD   7
5122  025114  025512                                                           .WORD   EMT2
5123  025116  000000                                                           .WORD   0
5124  025120                    18$:
5125  025120                            PRINTB  #FMT4,<B,ROMLOC(R4)>,R1,R4
5126  025120  010446                                                           MOV     R4,-(SP)
5127  025122  010146                                                           MOV     R1,-(SP)
5128  025124  005046                                                           CLR     -(SP)
5129  025126  156416  025531                                                   BISB    ROMLOC(R4),(SP)
5130  025132  012746  025414                                                   MOV     #FMT4,-(SP)
5131  025136  012746  000004                                                   MOV     #4,-(SP)
5132  025142  010600                                                           MOV     SP,R0
5133  025144  104414                                                           TRAP    C$PNTB
5134  025146  062706  000012                                                   ADD     #12,SP
5135  025152                    20$:
5136  025152  022704  000005            CMP     #5,R4           ;DID WE FINISH THE LAST ROM?
5137  025156  001410                    BEQ     30$             ;IF YES - SKIP TO THE END
5138  025160  005204                    INC     R4              ;POINT TO THE NEXT ROM #
5139  025162  032704  000001            BIT     #BIT0,R4        ;IS THIS AN ODD #
5140  025166  001334                    BNE     15$             ;IF YES GO BACK AND READ THE HIGH BYTE
5141
5142  025170  062737  002000  002412            ADD     #2000,ROMAD     ;INCR. ADDRESS POINTER TO NEXT ROM #.
5143  025176  000723                            BR      10$
5144  025200                    30$:
5145  025200                      ENDSUB
5146  025200                                                                L10030:
5147  025200  104403                                                                 TRAP    C$ESUB
5148
5149  025202                    ENDTST
5150  025202                                                                L10025:
5151  025202  104401                                                                 TRAP    C$ETST
5152  025204  047045  040445  044515    FMT1:   .ASCIZ  /%N%AMICROCODE REVISION IN UNIT%D3%A:%N/
5153  025212  051103  041517  042117
5154  025220  020105  042522  044526
5155  025226  044523  047117  044440
5156  025234  020116  047125  052111
5157  025242  042045  022463  035101
5158  025250  047045     000
5159  025253     045  051101  046517    FMT2:   .ASCIZ  /%AROM%D2%A - REV. %T%N%AROM%D2%A - REV. %T%N/
5160  025260  042045  022462  020101
5161  025266  020055  042522  027126
5162  025274  022440  022524  022516
5163  025302  051101  046517  042045
5164  025310  022462  020101  020055
5165  025316  042522  027126  022440
5166  025324  022524  000116
5167  025330  040445  047522  022515    FMT3:   .ASCIZ  /%AROM%D2%A: CALCUATED CRC -%O6%A  CRC IN ROM =%O6%N/
```

```
5168  025336  031104  040445  020072
5169  025344  040503  041514  040525
5170  025352  042524  020104  051103
5171  025360  020103  022475  033117
5172  025366  040445  020040  051103
5173  025374  020103  047111  051040
5174  025402  046517  036440  047445
5175  025410  022466  000116
5176  025414  040445  022505  031104  FMT4:   .ASCIZ  /%AE%D2%A IS ROM %D1%A (SHOULD BE ROM %D1%A)%N/
5177  025422  040445  044440  020123
5178  025430  047522  020115  042045
5179  025436  022461  020101  051450
5180  025444  047510  046125  020104
5181  025452  042502  051040  046517
5182  025460  022440  030504  040445
5183  025466  022451  000116
5184
5185  025472  051103  026503  041503  EMT1:   .ASCIZ  /CRC-CCITT ERROR/
5186  025500  052111  020124  051105
5187  025506  047522  000122
5188  025512  047514  040503  044524  EMT2:   .ASCIZ  /LOCATION ERROR/
5189  025520  047117  042440  051122
5190  025526  051117     000
5191
5192  025531     003     002     004  ROMLOC: .BYTE 3,2,4,1,5,14.      ;ROM 0 = ROM LOCATION 3 ETC.
5193  025534     001     005     016
5194          025540                  .EVEN
5195  025540  000000                  REV1:   .WORD   0                ;ASCII VALUE OF THE REV. NUMBER
5196  025542  000000                  REV2:   .WORD   0                ;ASCII VALUE OF THE REV. NUMBER
5197
5198
5199
```

```
                        .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)
                        ;*******************************************************************************
025544                  BGNTST
025544                                                                  T3::
025544                          CLEAR                   ;MACRO FOR MASTER CLEAR
                                                        ;**** MACRO EXPANSION ****
025544  004737  011070          JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                        ;****                   ****
025550
025550                          ESCAPE  TST             ;IF ERROR, BR TO TEST END.
025550  104410                                                          TRAP    C$ESCAPE
025552  000072                                                          .WORD   L10031-.
025554  105777  154464          TSTB    @#BSEL3         ;IS THERE A DMR RESPONSE?
025560  001011                  BNE     1$
025562                          PRINTB  #FMG19          ;REPORT DEVICE NOT DMR.
025562  012746  017436                                                  MOV     #FMG19,-(SP)
025566  012746  000001                                                  MOV     #1,-(SP)
025572  010600                                                          MOV     SP,R0
025574  104414                                                          TRAP    C$PNTB
025576  062706  000004                                                  ADD     #4,SP
025602  000420                  BR      5$
025604                  1$:
025604  117701  154434          MOVB    @#BSEL3,R1      ;SAVE THE RESULT OF THE FIRST MASTER CLEAR.
025610                          CLEAR                   ;MASTER CLEAR AGAIN.
                                                        ;**** MACRO EXPANSION ****
025610  004737  011070          JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                        ;****                   ****
025614
025614                          ESCAPE  TST             ;IF ERROR, BR TO TEST END.
025614  104410                                                          TRAP    C$ESCAPE
```

```
5256  025616  000026                                                                  .WORD   L10031-.
5257  025620  117702  154420                MOVB    @#SEL3,R2       ;SAVE THE RESULTS OF THE SECOND MASTER CLEAR
5258  025624  060102                       ADD     R1,R2           ;ADD THE RESULTS OF THE 2 CLEARS
5259                                                                ;NOTE: ONE SHOULD BE 100 - MICRO TESTS NOT
5260                                                                ;ENABLED AND ONE SHOULD BE 200 - MICRO TESTS
5261                                                                ;SUCCESFULLY RUN.
5262  025626  122702  000300                CMPB    #300,R2         ;WAS THE MICROTEST COMPLETED?
5263  025632  001404                       BEQ     5$              ;IF YES - OK
5264  025634                               ERRDF   3,EMT3,ERRG3    ;MICROTEST NOT COMPLETED
5265  025634  104455                                                                  TRAP    C$ERDF
5266  025636  000003                                                                  .WORD   3
5267  025640  025646                                                                  .WORD   EMT3
5268  025642  015240                                                                  .WORD   ERRG3
5269  025644                       5$:
5270  025644                       ENDTST
5271  025644                                                                  L10031:
5272  025644  104401                                                                  TRAP    C$ETST
5273
5274  025646  044515  051103  052117  EMT3:   .ASCIZ  /MICROTEST NOT COMPLETED/
5275  025654  051505  020124  047516
5276  025662  020124  047503  050115
5277  025670  042514  042524  000104
5278                               .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 THF DDCMP
                                ;*               MESSAGE VARIABLES ARE PROPERLY INITIALIZED.
                                ;*
                                ;*****************************************************************
025676                          BGNTST
025676                                                                  T4::
025676                             BGNSUB
025676                                                                  T4.1:
025676  104402                                                                  TRAP    C$BSUB
025700                                  CLEAR                   ;MACRO FOR MASTER CLEAR COMMAND
                                                                ;**** MACRO EXPANSION ****
025700  004737  011070                  JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                                ;****                 ****
025704                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END
025704  104410                                                                  TRAP    C$ESCAPE
025706  000244                                                                  .WORD   L10032-.
                                                                ;BASE IN COMMAND WITH NO MAINTENANCE,
025710                                  BASEIN  0,BASE,DMR      ;BASE=BASE TABLE ADDRESS, AND DMR-11 MODE
                                                                ;**** MACRO EXPANSION ****
025710  004737  011266                  JSR     PC, $BASEI      ;CALL BASE IN ROUTINE
025714  000000                          .WORD   0               ;MAINTENANCE MODE BITS TO SET IN BSEL1
025716  002640                          .WORD   BASE            ;BASE TABLE ADDRESS
025720  000522                          .WORD   DMR             ;MODE
                                                                ;****                 ****
025722                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END
025722  104410                                                                  TRAP    C$ESCAPE
025724  000226                                                                  .WORD   L10032-.
025726                                  SHUTDN
                                                                ;**** MACRO EXPANSION ****
025726  004737  012562                  JSR     PC, $HALT       ;DMR HALT ROUTINE.
                                                                ;****                 ****
025732  132737  000020  002732          BITB    #BIT4,BASE+ISP7 ;SEE IF THE DMR MODE BIT IS SET IN THE
                                                                ;DMR SCRATCH PAD REGISTER 7 (BASE TABLE
                                                                ;LOCATION CONTAINS AN IMAGE OF SP7)
025740  001004                          BNE     10$             ;OK IF SET - BR
025742                                  ERRDF   20,EMT4
025742  104455                                                                  TRAP    C$ERDF
025744  000024                                                                  .WORD   20
025746  026374                                                                  .WORD   EMT4
025750  000000                                                                  .WORD   0
025752                          10$:
                                                                ;CHECK MESSAGE EXCHANGE VALUES
```

```
5335
5336  025752  105737  002702                  TSTB    BASE+R          ;IN THE BASE TABLE.
5337  025756  001015                          BNE     20$             ; #R (MESSAGE RECEIVED) = 0?
5338  025760  105737  002703                  TSTB    BASE+N          ;ERROR IF NON ZERO
5339  025764  001012                          BNE     20$             ; #N (MESSAGE TRANSMITTED) = 0?
5340  025766  105737  002704                  TSTB    BASE+A          ;ERROR IF NON ZERO
5341  025772  001007                          BNE     20$             ; #A (MESSAGE ACKNOWLEDGED) = 0?
5342  025774  122737  000001  002705          CMPB    #1,BASE+T       ;ERROR IF NOT EQUAL TO 1.
5343  026002  001003                          BNE     20$             ; #T (NEXT MESSAGE # TRANSMITTED) = 1?
5344  026004  105737  002706                  TSTB    BASE+X          ; #X (LAST MESSAGE TRANSMITTED) = 0?
5345  026010  001404                          BEQ     30$
5346  026012                          20$:
5347  026012                                  ERRDF   20,EMT5,ERRT1
5348  026012  104455                                                          TRAP    C$ERDF
5349  026014  000024                                                          .WORD   20
5350  026016  026421                                                          .WORD   EMT5
5351  026020  026154                                                          .WORD   ERRT1
5352  026022                          30$:
5353  026022                             ENDSUB
5354  026022                                                          L10033:
5355  026022  104403                                                          TRAP    C$ESUB
5356
5357  026024                             BGNSUB
5358  026024                                                          T4.2:
5359  026024  104402                                                          TRAP    C$BSUB
5360  026026                                  CLEAR                   ;MACRO FOR MASTER CLEAR COMMAND
5361                                                                  ;**** MACRO EXPANSION ****
5362  026026  004737  011070                  JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
5363                                                                  ;****                ****
5364
5365  026032                          ESCAPE  TST                     ;IF ERROR, BR TO TEST END
5366  026032  104410                                                          TRAP    C$ESCAPE
5367  026034  000116                                                          .WORD   L10032-.
5368
5369                                                                  ;BASE IN COMMAND WITH NO MAINTENANCE
5370  026036                          BASEIN  0,BASE,0                ;AND DMC MODE.
5371                                                                  ;**** MACRO EXPANSION ****
5372  026036  004737  011266          JSR     PC, $BASEI              ;CALL BASE IN ROUTINE
5373  026042  000000                          .WORD   0               ;MAINTENANCE MODE BITS TO SET IN BSEL1
5374  026044  002640                          .WORD   BASE            ;BASE TABLE ADDRESS
5375  026046  000000                          .WORD   0               ;MODE
5376                                                                  ;****                ****
5377
5378  026050                          ESCAPE  TST                     ;IF ERROR, BR TO TEST END
5379  026050  104410                                                          TRAP    C$ESCAPE
5380  026052  000100                                                          .WORD   L10032-.
5381  026054                          SHUTDN
5382                                                                  ;**** MACRO EXPANSION ****
5383  026054  004737  012562          JSR     PC, $HALT               ;DMR HALT ROUTINE.
5384                                                                  ;****                ****
5385  026060  132737  000020  002732  BITB    #BIT4,BASE+ISP7         ;SEE IF THE DMR MODE BIT IS CLEAR IN THE
5386                                                                  ;DMR SCRATCH PAD REGISTER 7 (BASETABLE
5387                                                                  ;LOCATION CONTAINS AN IMAGE OF SP7)
5388  026066  001404                          BEQ     10$             ;OK IF CLEAR - BR
5389  026070                                  ERRDF   20,EMT6
5390  026070  104455                                                          TRAP    C$ERDF
```

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5391  026072  000024                                                                  .WORD   20
5392  026074  026467                                                                  .WORD   EMT6
5393  026076  000000                                                                  .WORD   0
5394  026100                        10$:
5395                                                    ;CHECK MESSAGE EXCHANGE VALUES
5396                                                    ;IN THE BASE TABLE.
5397  026100  105737  002702                TSTB    BASE+R          ; #R (MESSAGE RECEIVED) = 0?
5398  026104  001015                        BNE     20$             ;ERROR IF NON ZERO
5399  026106  105737  002703                TSTB    BASE+N          ; #N (MESSAGE TRANSMITTED) = 0?
5400  026112  001012                        BNE     20$             ;ERROR IF NON ZERO
5401  026114  105737  002704                TSTB    BASE+A          ; #A (MESSAGE ACKNOWLEDGED) = 0?
5402  026120  001007                        BNE     20$             ;ERROR IF NON ZERO
5403  026122  122737  000001  002705        CMPB    #1,BASE+T       ; #T (NEXT MESSAGE # TRANSMITTED) = 1?
5404  026130  001003                        BNE     20$             ;ERROR IF NOT EQUAL TO 1.
5405  026132  105737  002706                TSTB    BASE+X          ; #X (LAST MESSAGE TRANSMITTED) = 0?
5406  026136  001404                        BEQ     30$
5407  026140                        20$:
5408  026140                                ERRDF   20,EMT5,FRRT1
5409  026140  104455                                                                 TRAP    C$ERDF
5410  026142  000024                                                                 .WORD   20
5411  026144  026421                                                                 .WORD   EMT5
5412  026146  026154                                                                 .WORD   ERRT1
5413  026150                        30$:
5414  026150                           ENDSUB
5415  026150                                                                  L10034:
5416  026150  104403                                                                 TRAP    C$ESUB
5417
5418  026152                        ENDTST
5419  026152                                                                  L10032:
5420  026152  104401                                                                 TRAP    C$ETST
5421
5422  026154                        BGNMSG  ERRT1
5423  026154                                                                  ERRT1::
5424  026154  105737  002702                TSTB    BASE+R          ;IS #R = 0?
5425  026160  001413                        BEQ     1$              ;OK - IF ZERO
5426  026162                                PRINTB  #FMT5,<B,BASE+R> ;PRINT #R
5427  026162  005046                                                                 CLR     -(SP)
5428  026164  153716  002702                                                       BISB    BASE+R,(SP)
5429  026170  012746  026526                                                       MOV     #FMT5,-(SP)
5430  026174  012746  000002                                                       MOV     #2,-(SP)
5431  026200  010600                                                               MOV     SP,R0
5432  026202  104414                                                               TRAP    C$PNTB
5433  026204  062706  000006                                                       ADD     #6,SP
5434  026210                        1$:
5435  026210  105737  002703                TSTB    BASE+N          ;IS #N = 0?
5436  026214  001413                        BEQ     2$              ;OK - IF ZERO
5437  026216                                PRINTB  #FMT6,<B,BASE+N> ;PRINT #N
5438  026216  005046                                                                 CLR     -(SP)
5439  026220  153716  002642                                                       BISB    BASE+2,(SP)
5440  026224  012746  026557                                                       MOV     #FMT6,-(SP)
5441  026230  012746  000002                                                       MOV     #2,-(SP)
5442  026234  010600                                                               MOV     SP,R0
5443  026236  104414                                                               TRAP    C$PNTB
5444  026240  062706  000006                                                       ADD     #6,SP
5445  026244                        2$:
5446
```

```
5447  026244  105737  002704                  TSTB    BASE+A          ;IS #A = 0?
5448  026250  001413                          BEQ     3$              ;OK - IF ZERO
5449  026252                                  PRINTB  #FMT7,<B,BASE+A> ;PRINT #A
5450  026252  005046                                                          CLR     -(SP)
5451  026254  153716  002704                                                  BISB    BASE+A,(SP)
5452  026260  012746  026610                                                  MOV     #FMT7,-(SP)
5453  026264  012746  000002                                                  MOV     #2,-(SP)
5454  026270  010600                                                          MOV     SP,R0
5455  026272  104414                                                          TRAP    C$PNTB
5456  026274  062706  000006                                                  ADD     #6,SP
5457  026300                          3$:
5458  026300  122737  000001  002705          CMPB    #1,BASE+T       ;IS #T = 1?
5459  026306  001413                          BEQ     4$              ;OK - IF ONE
5460  026310                                  PRINTB  #FMT8,<B,BASE+T> ;PRINT #T
5461  026310  005046                                                          CLR     -(SP)
5462  026312  153716  002705                                                  BISB    BASE+T,(SP)
5463  026316  012746  026641                                                  MOV     #FMT8,-(SP)
5464  026322  012746  000002                                                  MOV     #2,-(SP)
5465  026326  010600                                                          MOV     SP,R0
5466  026330  104414                                                          TRAP    C$PNTB
5467  026332  062706  000006                                                  ADD     #6,SP
5468  026336                          4$:
5469  026336  105737  002706                  TSTB    BASE+X          ;IS #X = 0?
5470  026342  001413                          BEQ     5$              ;OK - IF ZERO
5471  026344                                  PRINTB  #FMT9,<B,BASE+X> ;PRINT #X
5472  026344  005046                                                          CLR     -(SP)
5473  026346  153716  002706                                                  BISB    BASE+X,(SP)
5474  026352  012746  026672                                                  MOV     #FMT9,-(SP)
5475  026356  012746  000002                                                  MOV     #2,-(SP)
5476  026362  010600                                                          MOV     SP,R0
5477  026364  104414                                                          TRAP    C$PNTB
5478  026366  062706  000006                                                  ADD     #6,SP
5479  026372                          5$:
5480  026372                          ENDMSG
5481  026372                                                          L10035:
5482  026372  104423                                                          TRAP    C$MSG
5483
5484  026374  046504  020122  047515  EMT4:   .ASCIZ  /DMR MODE BIT NOT SET/
5485  026402  042504  041040  052111
5486  026410  047040  052117  051440
5487  026416  052105     000
5488  026421     104  041504  050115  EMT5:   .ASCIZ  /DDCMP MESSAGE VARIABLE(S) NOT CORRECT/
5489  026426  046440  051505  040523
5490  026434  042507  053040  051101
5491  026442  040511  046102  024105
5492  026450  024523  047040  052117
5493  026456  041440  051117  042522
5494  026464  052103     000
5495  026467     104  041515  046440  EMT6:   .ASCIZ  /DMC MODE - DMR BIT NOT CLEARED/
5496  026474  042117  020105  020055
5497  026502  046504  020122  044502
5498  026510  020124  047516  020124
5499  026516  046103  040505  042522
5500  026524  000104
5501
5502  026526  040445  051043  024040  FMT5:   .ASCIZ  /%A#R (MSG. RCVD) = %D3%N/
```

```
 5503  026534  051515  027107  051040
 5504  026542  053103  024504  036440
 5505  026550  022440  031504  047045
 5506  026556     000
 5507  026557     045  021501  020116  FMT6:   .ASCIZ  /%A#N (MSG. XMIT) = %D3%N/
 5508  026564  046450  043523  020056
 5509  026572  046530  052111  020051
 5510  026600  020075  042045  022463
 5511  026606  000116
 5512  026610  040445  040443  024040  FMT7:   .ASCIZ  /%A#A (MSG. ACK)  - %D3%N/
 5513  026616  051515  027107  040440
 5514  026624  045503  020051  036440
 5515  026632  022440  031504  047045
 5516  026640     000
 5517  026641     045  021501  020124  FMT8:   .ASCIZ  /%A#T (NEXT XMIT) = %D3%N/
 5518  026646  047050  054105  020124
 5519  026654  046530  052111  020051
 5520  026662  020075  042045  022463
 5521  026670  000116
 5522  026672  040445  054043  024040  FMT9:   .ASCIZ  /%A#X (LAST XMIT) = %D3%N/
 5523  026700  040514  052123  054040
 5524  026706  044515  024524  036440
 5525  026714  022440  031504  047045
 5526  026722     000
 5527          026724                          .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.
                        ;*
                        ;*
                        ;*******************************************************************************
026724                  BGNTST
026724                                                                  T5::
026724                    BGNSUB
026724                                                                  T5.1:
026724  104402                                                                  TRAP    C$BSUB
026726                          CLEAR                   ;MACRO FOR MASTER CLEAR COMMAND
                                                        ;**** MACRO EXPANSION ****
026726  004737  011070          JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                        ;****                 ****

026732                          ESCAPE  TST             ;IF ERROR, BR TO TEST END
026732  104410                                                          TRAP    C$ESCAPE
026734  000330                                                          .WORD   L10036-.

026736                          BASEIN                  ;BASE IN COMMAND WITH  LINE UNIT LOOP,
                                                        ;**** MACRO EXPANSION ****
026736  004737  011266          JSR     PC, $BASEI      ;CALL BASE IN ROUTINE WITH DEFAULTS
026742  004000                  .WORD   LPLU            ;SET LINE UNIT LOOP
026744  002640                  .WORD   BASE            ;BASE TABLE ADDRESS
026746  000522                  .WORD   DMR             ;DMR-11 MODE
                                                        ;****                 ****

026750                          ESCAPE  TST             ;IF ERROR, BR TO TEST END
026750  104410                                                          TRAP    C$ESCAPE
026752  000312                                                          .WORD   L10036-.
026754                          DMRIN   EXERR           ;ENABLE EXTENDED ERROR NOTIFICATION
                                                        ;**** MACRO EXPANSION ****
026754  004737  012062          JSR     PC, $DMRIN      ;CALL DMR MODE INPUT ROUTINE
026760  000006                  .WORD   EXERR           ;INPUT COMMAND
026762  000000                  .WORD   0               ;NO SEL4
026764  000000                  .WORD   0               ;NO SEL6
                                                        ;****                 ****

026766                          ESCAPE  TST             ;IF ERROR, BR TO TEST END
026766  104410                                                          TRAP    C$ESCAPE
026770  000274                                                          .WORD   L10036-.
026772                          SHUTDN                  ;HALT THE DMR
                                                        ;**** MACRO EXPANSION ****
026772  004737  012562          JSR     PC, $HALT       ;DMR HALT ROUTINE.
                                                        ;****                 ****
026776                          ESCAPE  TST             ;IF ERROR, BR TO TEST END
```

```
5584  026776  104410                                                                  TRAP    C$ESCAPE
5585  027000  000264                                                                  .WORD   L10036-.
5586  027002  132737  000001  002736          BITB    #BIT0,BASE+ISP13 ;CHECK EXT ENABLE BIT IN THE BASE TABLE.
5587                                                                   ;IMAGE OF SCRATCH PAD 13.
5588  027010  001005                          BNE     10$              ;BIT SET - OK.
5589  027012                                  ERRDF   24,EMT7          ;ERROR EXT ENABLE CLEAR
5590  027012  104455                                                                  TRAP    C$ERDF
5591  027014  000030                                                                  .WORD   24
5592  027016  027574                                                                  .WORD   EMT7
5593  027020  000000                                                                  .WORD   0
5594  027022  000430                          BR      20$
5595  027024                          10$:
5596  027024                          BASEIN  LPLU,BASE,RES.DMR ;BASE IN COMMAND WITH RESUME SET.
5597                                                            ;**** MACRO EXPANSION ****
5598  027024  004737  011266                JSR     PC, $BASEI       ;CALL BASE IN ROUTINE
5599  027030  004000                                  .WORD   LPLU     ;MAINTENANCE MODE BITS TO SET IN BSEL1
5600  027032  002640                                  .WORD   BASE     ;BASE TABLE ADDRESS
5601  027034  010522                                  .WORD   RES!DMR  ;MODE
5602                                                            ;****                    ****
5603
5604  027036                          DMRIN   DXERR            ;DISABLE EXTENDED ERROR NOTIFICATION.
5605                                                           ;**** MACRO EXPANSION ****
5606  027036  004737  012062                JSR     PC, $DMRIN       ;CALL DMR MODE INPUT ROUTINE
5607  027042  000007                                  .WORD   DXERR    ;INPUT COMMAND
5608  027044  000000                                  .WORD   0        ;NO SEL4
5609  027046  000000                                  .WORD   0        ;NO SEL6
5610                                                            ;****                    ****
5611
5612  027050                          ESCAPE  TST              ;IF ERROR, BR TO TEST END
5613  027050  104410                                                                  TRAP    C$ESCAPE
5614  027052  000212                                                                  .WORD   L10036-.
5615  027054                          SHUTDN                   ;HALT THE DMR
5616                                                           ;**** MACRO EXPANSION ****
5617  027054  004737  012562                JSR     PC, $HALT        ;DMR HALT ROUTINE.
5618                                                           ;****                    ****
5619  027060                          ESCAPE  TST              ;IF ERROR, BR TO TEST END.
5620  027060  104410                                                                  TRAP    C$ESCAPE
5621  027062  000202                                                                  .WORD   L10036-.
5622  027064  132737  000001  002736          BITB    #BIT0,BASE+ISP13 ;CHECK EXT ENABLE BIT IN THE BASE TABLE.
5623                                                                   ;IMAGE OF SCRATCH PAD 13.
5624  027072  001404                          BEQ     20$              ;IF CLEAR OK
5625  027074                                  ERRDF   24,EMT7          ;ERROR EXT ENABLE SET
5626  027074  104455                                                                  TRAP    C$ERDF
5627  027076  000030                                                                  .WORD   24
5628  027100  027574                                                                  .WORD   EMT7
5629  027102  000000                                                                  .WORD   0
5630  027104                  20$:
5631  027104                    ENDSUB
5632  027104                                                                  L10037:
5633  027104  104403                                                                  TRAP    C$ESUB
5634
5635  027106                    BGNSUB
5636  027106                                                                  T5.2:
5637  027106  104402                                                                  TRAP    C$BSUB
5638  027110                          CLEAR                    ;MACRO FOR MASTER CLEAR COMMAND
5639                                                           ;**** MACRO EXPANSION ****
```

```
5640  027110  004737  011070                JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
5641                                                                  ;****                   ****
5642
5643  027114                                ESCAPE  TST             ;IF ERROR, BR TO TEST END
5644  027114  104410                                                                 TRAP    C$ESCAPE
5645  027116  000146                                                                 .WORD   L10036-.
5646
5647  027120                                BASEIN                  ;BASE IN COMMAND WITH  LINE UNIT LOOP,
5648                                                                  ;**** MACRO EXPANSION ****
5649  027120  004737  011266                JSR     PC, $BASEI      ;CALL BASE IN ROUTINE WITH DEFAULTS
5650  027124  004000                                .WORD   LPLU    ;SET LINE UNIT LOOP
5651  027126  002640                                .WORD   BASE    ;BASE TABLE ADDRESS
5652  027130  000522                                .WORD   DMR     ;DMR-11 MODE
5653                                                                  ;****                   ****
5654
5655  027132                                ESCAPE  TST             ;IF ERROR, BR TO TEST END
5656  027132  104410                                                                 TRAP    C$ESCAPE
5657  027134  000130                                                                 .WORD   L10036-.
5658  027136                                DMRIN   TIMER,0,54      ;SET REP/SELECT TIMER VALUE
5659                                                                  ;**** MACRO EXPANSION ****
5660  027136  004737  012062                JSR     PC, $DMRIN      ;CALL DMR MODE INPUT ROUTINE
5661  027142  000012                                .WORD   TIMER   ;INPUT COMMAND
5662  027144  000000                                .WORD   0       ;SEL4 VALUE (OR BITS TO CLEAR IN BSEL6)
5663  027146  000054                                .WORD   54      ;SEL6 VALUE (OR BITS TO SET IN BSEL6)
5664                                                                  ;****                   ****
5665
5666  027150                                ESCAPE  TST             ;IF ERROR, BR TO TEST END
5667  027150  104410                                                                 TRAP    C$ESCAPE
5668  027152  000112                                                                 .WORD   L10036-.
5669
5670                                                                  ;SET THRESHOLD VALUES AS FOLLOWS:
5671                                                                  ;BSEL4 = NAKS RECEIVED (3)
5672                                                                  ;BSEL5 = NAKS TRANSMITTED (13)
5673                                                                  ;BSEL6 = REP/SEL SENT (15)
5674                                                                  ;BSEL7 = NO BUFFFER (4)
5675  027154                                DMRIN   THRESH,5403,2015
5676                                                                  ;**** MACRO EXPANSION ****
5677  027154  004737  012062                JSR     PC, $DMRIN      ;CALL DMR MODE INPUT ROUTINE
5678  027160  000013                                .WORD   THRESH  ;INPUT COMMAND
5679  027162  005403                                .WORD   5403    ;SEL4 VALUE (OR BITS TO CLEAR IN BSEL6)
5680  027164  002015                                .WORD   2015    ;SEL6 VALUE (OR BITS TO SET IN BSEL6)
5681                                                                  ;****                   ****
5682
5683  027166                                ESCAPE  TST             ;IF ERROR, BR TO TEST END
5684  027166  104410                                                                 TRAP    C$ESCAPE
5685  027170  000074                                                                 .WORD   L10036-.
5686  027172                                SHUTDN                  ;HALT THE DMR.
5687                                                                  ;**** MACRO EXPANSION ****
5688  027172  004737  012562                JSR     PC, $HALT       ;DMR HALT ROUTINE.
5689                                                                  ;****                   ****
5690  027176                                ESCAPE  TST             ;IF ERROR, BR TO TEST END
5691  027176  104410                                                                 TRAP    C$ESCAPE
5692  027200  000064                                                                 .WORD   L10036-.
5693  027202  122737  000054  002715        CMPB    #54,BASE+PRETIM ;CHECK REP/SEL TIME IN BASE TABLE.
5694  027210  001020                        BNE     10$             ;IF NOT 54, BR TO ERROR.
5695  027212  122737  000015  002724        CMPB    #15,BASE+TH3L   ;CHECK REP. THRESH. IN BASE TABLE.
```

```
5696  027220  001014                          BNE     10$             ;IF NOT 15, BR TO ERROR.
5697  027222  122737  000003  002720          CMPB    #3,BASE+TH1L    ;CHECK NAK RCVD. THRESH. IN BASE TABLE.
5698  027230  001010                          BNE     10$             ;IF NOT 3, BR TO ERROR.
5699  027232  122737  000013  002722          CMPB    #13,BASE+TH2L   ;CHECK NAK SENT THRESH. IN BASE TABLE.
5700  027240  001004                          BNE     10$             ;IF NOT 13, BR TO ERROR
5701  027242  122737  000004  002726          CMPB    #4,BASE+TH4L    ;CHECK NO BUF. THRESH. IN BASE TABLE.
5702  027250  001404                          BEQ     20$             ;IF 4, ALL CHECKS OK - EXIT
5703  027252                          10$:
5704  027252                                  ERRDF   24,EMT8,ERRT3
5705  027252  104455                                                                  TRAP    C$ERDF
5706  027254  000030                                                                  .WORD   24
5707  027256  027625                                                                  .WORD   EMT8
5708  027260  027266                                                                  .WORD   ERRT3
5709  027262                          20$:
5710  027262                            ENDSUB
5711  027262                                                                L10040:
5712  027262  104403                                                                 TRAP    C$ESUB
5713  027264                          ENDTST
5714  027264                                                                L10036:
5715  027264  104401                                                                 TRAP    C$ETST
5716
5717  027266                          BGNMSG  ERRT3
5718  027266                                                                ERRT3::
5719  027266                                  PRINTB  #FMG1,@SEL0,@SEL2 ;PRINT SEL0 AND SEL2
5720  027266  017746  152742                                                        MOV     @SEL2,-(SP)
5721  027272  017746  152734                                                        MOV     @SEL0,-(SP)
5722  027276  012746  016302                                                        MOV     #FMG1,-(SP)
5723  027302  012746  000003                                                        MOV     #3,-(SP)
5724  027306  010600                                                                MOV     SP,R0
5725  027310  104414                                                                TRAP    C$PNTB
5726  027312  062706  000010                                                        ADD     #10,SP
5727  027316                                  PRINTB  #FMT11,<B,BASE+ISP13> ;PRINT OUT THE IMAGE OF SCRATCH PAD 13.
5728  027316  005046                                                                CLR     -(SP)
5729  027320  153716  002736                                                        BISB    BASE+ISP13,(SP)
5730  027324  012746  027662                                                        MOV     #FMT11,-(SP)
5731  027330  012746  000002                                                        MOV     #2,-(SP)
5732  027334  010600                                                                MOV     SP,R0
5733  027336  104414                                                                TRAP    C$PNTB
5734  027340  062706  000006                                                        ADD     #6,SP
5735  027344  122737  000054  002715          CMPB    #54,BASE+PRETIM ;IS REP/SEL TIME OK?
5736  027352  001413                          BEQ     1$              ;BR IF OK
5737  027354                                  PRINTB  #FMT12,<B,BASE+PRETIM> ;PRINT IT OUT.
5738  027354  005046                                                                CLR     -(SP)
5739  027356  153716  002715                                                        BISB    BASE+PRETIM,(SP)
5740  027362  012746  027713                                                        MOV     #FMT12,-(SP)
5741  027366  012746  000002                                                        MOV     #2,-(SP)
5742  027372  010600                                                                MOV     SP,R0
5743  027374  104414                                                                TRAP    C$PNTB
5744  027376  062706  000006                                                        ADD     #6,SP
5745  027402                          1$:
5746  027402  122737  000003  002720          CMPB    #3,BASE+TH1L    ;IS NAK RCVD OK?
5747  027410  001413                          BEQ     2$              ;BR IF OK.
5748  027412                                  PRINTB  #FMT13,<B,BASE+TH1L> ;PRINT IT OUT
5749  027412  005046                                                                CLR     -(SP)
5750  027414  153716  002720                                                        BISB    BASE+TH1L,(SP)
5751  027420  012746  027750                                                        MOV     #FMT13,-(SP)
```

```
027424  012746  000002                                                           MOV     #2,-(SP)
027430  010600                                                                   MOV     SP,R0
027432  104414                                                                   TRAP    C$PNTB
027434  062706  000006                                                           ADD     #6,SP
027440                          2$:
027440  122737  000013  002722          CMPB    #13,BASE+TH2L   ;IS NAK SENT OK?
027446  001413                          BEQ     3$              ;BR IF OK.
027450                                  PRINTB  #FMT14,<B,BASE+TH2L> ;PRINT IT OUT
027450  005046                                                                   CLR     -(SP)
027452  153716  002722                                                           BISB    BASE+TH2L,(SP)
027456  012746  030005                                                           MOV     #FMT14,-(SP)
027462  012746  000002                                                           MOV     #2,-(SP)
027466  010600                                                                   MOV     SP,R0
027470  104414                                                                   TRAP    C$PNTB
027472  062706  000006                                                           ADD     #6,SP
027476                          3$:
027476  122737  000015  002724          CMPB    #15,BASE+TH3L   ;IS REP LEVEL OK?
027504  001413                          BEQ     4$              ;BR IF OK.
027506                                  PRINTB  #FMT15,<B,BASE+TH3L> ;PRINT IT OUT
027506  005046                                                                   CLR     -(SP)
027510  153716  002724                                                           BISB    BASE+TH3L,(SP)
027514  012746  030042                                                           MOV     #FMT15,-(SP)
027520  012746  000002                                                           MOV     #2,-(SP)
027524  010600                                                                   MOV     SP,R0
027526  104414                                                                   TRAP    C$PNTB
027530  062706  000006                                                           ADD     #6,SP
027534                          4$:
027534  122737  000004  002726          CMPB    #4,BASE+TH4L    ;IS NO BUFFER LEVEL OK?
027542  001413                          BEQ     5$              ;BR IF OK.
027544                                  PRINTB  #FMT16,<B,BASE+TH4L> ;PRINT IT OUT
027544  005046                                                                   CLR     -(SP)
027546  153716  002726                                                           BISB    BASE+TH4L,(SP)
027552  012746  030077                                                           MOV     #FMT16,-(SP)
027556  012746  000002                                                           MOV     #2,-(SP)
027562  010600                                                                   MOV     SP,R0
027564  104414                                                                   TRAP    C$PNTB
027566  062706  000006                                                           ADD     #6,SP
027572                          5$:
027572                          ENDMSG
027572                                                                   L10041:
027572  104423                                                                   TRAP    C$MSG


027574  054105  027124  042440  EMT7:   .ASCIZ  /EXT. ERROR BIT INCORRECT/
027602  051122  051117  041040
027610  052111  044440  041516
027616  051117  042522  052103
027624     000
027625     104  051115  046440  EMT8:   .ASCIZ  /DMR MODE INPUT COMMAND ERROR/
027632  042117  020105  047111
027640  052520  020124  047503
027646  046515  047101  020104
027654  051105  047522  000122

027662  040445  046511  043501  FMT11:  .ASCIZ  /%AIMAGE OF SP 13 = %D3%N/
027670  020105  043117  051440
```

```
5808  027676  020120  031461  036440
5809  027704  022440  031504  047045
5810  027712     000
5811  027713     045  051101  050105  FMT12:  .ASCIZ  /%AREP-SEL TIME VALUE = %D3%N/
5812  027720  051455  046105  052040
5813  027726  046511  020105  040526
5814  027734  052514  020105  020075
5815  027742  042045  022463  000116
5816  027750  040445  040516  020113  FMT13:  .ASCIZ  /%ANAK RCVD THRESHOLD = %D3%N/
5817  027756  041522  042126  052040
5818  027764  051110  051505  047510
5819  027772  042114  036440  022440
5820  030000  031504  047045     000
5821  030005     045  047101  045501  FMT14:  .ASCIZ  /%ANAK SENT THRESHOLD - %D3%N/
5822  030012  051440  047105  020124
5823  030020  044124  042522  044123
5824  030026  046117  020104  020075
5825  030034  042045  022463  000116
5826  030042  040445  042522  020120  FMT15:  .ASCIZ  /%AREP SENT THRESHOLD = %D3%N/
5827  030050  042523  052116  052040
5828  030056  051110  051505  047510
5829  030064  042114  036440  022440
5830  030072  031504  047045     000
5831  030077     045  047101  020117  FMT16:  .ASCIZ  /%ANO BUFFER THRESHOLD = %D3%N/
5832  030104  052502  043106  051105
5833  030112  052040  051110  051505
5834  030120  047510  042114  036440
5835  030126  022440  031504  047045
5836  030134     000
5837          030136                  .EVEN
5838
5839
```

```
                        .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.
                        ;*
                        ;*
                        ;*****************************************************************
030136                  BGNTST
                                                                        T6::
030136                    BGNSUB
                                                                        T6.1:
030136  104402                                                                TRAP    C$BSUB
030140                          CLEAR                   ;MACRO FOR MASTER CLEAR
                                                        ;**** MACRO EXPANSION ****
030140  004737  011070          JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                        ;****                  ****
                        
030144                          ESCAPE  TST             ;IF ERROR, BR TO TEST END.
030144  104410                                                                TRAP    C$ESCAPE
030146  000404                                                                .WORD   L10042-.
030150                          BASEIN                  ;MACRO FOR BASE IN COMMAND
                                                        ;**** MACRO EXPANSION ****
030150  004737  011266          JSR     PC, $BASEI      ;CALL BASE IN ROUTINE WITH DEFAULTS
030154  004000                  .WORD   LPLU            ;SET LINE UNIT LOOP
030156  002640                  .WORD   BASE            ;BASE TABLE ADDRESS
030160  000522                  .WORD   DMR             ;DMR-11 MODE
                                                        ;****                  ****
                        
030162                          ESCAPE  TST             ;IF ERROR, BR TO TEST END.
030162  104410                                                                TRAP    C$ESCAPE
030164  000366                                                                .WORD   L10042-.
030166                          CNTRIN                  ;MACRO FOR CONTROL IN (FULL DUPLEX)
                                                        ;**** MACRO EXPANSION ****
030166  004737  011522          JSR     PC, $CNTIN      ;CALL CONTROL IN ROUTINE WITH DEFAULT
030172  000000                  .WORD   0               ;SEL6 - FULL DUPLEX, RUN MODE, 1 SEC START.
                                                        ;****                  ****
                        
030174                          ESCAPE  TST             ;IF ERROR, BR TO TEST END.
030174  104410                                                                TRAP    C$ESCAPE
030176  000354                                                                .WORD   L10042-.
                        
030200  052777  000057  152024  BIS     #RQI!RMODEM,@SEL0 ;SET RQI AND READ MODEM COMMAND
030206                          WAIT    RDI             ;WAIT FOR RDI TO BE SET
                                                        ;**** MACRO EXPANSION ****
```

```
5896  030206  004737  010276                  JSR     PC, $WAIT       ;CALL WAIT ROUTINE
5897  030212  000000                          .WORD   0               ;FLAG THAT WE'RE WAITING FOR RDI
5898                                          ;****                   ****
5899  030214  032777  000020  152014          BIT     #BIT4,@SEL4     ;IS THE HDX BIT SET IN MODEM STATUS REG?
5900  030222  001404                          BEQ     10$             ;OK - IF BIT CLEAR
5901  030224                                  ERRDF   21,EMT9         ;ERROR HDX BIT SET
5902  030224  104455                                                          TRAP    C$ERDF
5903  030226  000025                                                          .WORD   21
5904  030230  030554                                                          .WORD   EMT9
5905  030232  000000                                                          .WORD   0
5906  030234                          10$:
5907  030234                          WAIT    RQI             ;CLEAR RQI AND WAIT FOR RDI TO CLEAR.
5908                                          ;**** MACRO EXPANSION ****
5909  030234  004737  010706                  JSR     PC, $CLRQI      ;CLEAR RQI AND WAIT FOR IT TO BE CLEARED.
5910                                          ;****                   ****
5911  030240                          SHUTDN                  ;HALT DMR
5912                                          ;**** MACRO EXPANSION ****
5913  030240  004737  012562                  JSR     PC, $HALT       ;DMR HALT ROUTINE.
5914                                          ;****                   ****
5915  030244                          ESCAPE  TST             ;IF ERROR, EXIT.
5916  030244  104410                                                          TRAP    C$ESCAPE
5917  030246  000304                                                          .WORD   L10042-.
5918  030250  132737  000020  002732          BITB    #BIT4,BASE+ISP7 ;IS THE DDCMP RUN BIT SET IN IMAGE OF SP 7.
5919  030256  001004                          BNE     20$
5920  030260                                  ERRDF   21,EMT10                ;ERROR DDCMP RUN BIT NOT SET
5921  030260  104455                                                          TRAP    C$ERDF
5922  030262  000025                                                          .WORD   21
5923  030264  030604                                                          .WORD   EMT10
5924  030266  000000                                                          .WORD   0
5925  030270                          20$:
5926  030270                            ENDSUB
5927  030270                                                          L10043:
5928  030270  104403                                                         TRAP    C$ESUB
5929
5930  030272                          BGNSUB
5931  030272                                                          T6.2:
5932  030272  104402                                                         TRAP    C$BSUB
5933  030274                                BASEIN  LPLU,BASE,RES!DMR ;BASE IN WITH RESUME.
5934                                                                  ;**** MACRO EXPANSION ****
5935  030274  004737  011266                  JSR     PC, $BASEI      ;CALL BASE IN ROUTINE
5936  030300  004000                          .WORD   LPLU            ;MAINTENANCE MODE BITS TO SET IN BSEL1
5937  030302  002640                          .WORD   BASE            ;BASE TABLE ADDRESS
5938  030304  010522                          .WORD   RES!DMR         ;MODE
5939                                                                  ;****                   ****
5940
5941  030306                                CNTRIN  HDX               ;CONTROL IN COMMAND WITH HDX.
5942                                                                  ;**** MACRO EXPANSION ****
5943  030306  004737  011522                  JSR     PC, $CNTIN      ;CALL CONTROL IN ROUTINE
5944  030312  002000                          .WORD   HDX             ;SEL6 - (DUPLEX, MODE)
5945                                                                  ;****                   ****
5946
5947  030314                                ESCAPE  TST               ;IF ERROR, BR TO TEST END.
5948  030314  104410                                                                  TRAP    C$ESCAPE
5949  030316  000234                                                                  .WORD   L10042-.
5950  030320  052777  000057  151704          BIS     #RQI!RMODEM,@SEL0 ;SET RQI AND READ MODEM COMMAND
5951  030326                                WAIT    RDI               ;WAIT FOR RDI TO BE SET
```

```
5952
5953  030326  004737  010276          JSR     PC, $WAIT       ;**** MACRO EXPANSION ****
5954  030332  000000                  .WORD   0               ;CALL WAIT ROUTINE
5955                                                          ;FLAG THAT WE'RE WAITING FOR RDI
5956  030334  032777  000020  151674  BIT     #BIT4,@SEL4     ;****                    ****
5957  030342  001004                  BNE     10$             ;IS THE HDX BIT SET IN MODEM STATUS REG?
5958  030344                          ERRDF   21,EMT11        ;OK - IF BIT SET
5959  030344  104455                                                  ;ERROR HDX BIT CLEAR.
                                                                TRAP    C$ERDF
5960  030346  000025                                                   .WORD   21
5961  030350  030632                                                   .WORD   EMT11
5962  030352  000000                                                   .WORD   0
5963  030354                  10$:
5964  030354                          SHUTDN                  ;HALT THE DMR.
5965                                                          ;**** MACRO EXPANSION ****
5966  030354  004737  012562          JSR     PC, $HALT       ;DMR HALT ROUTINE.
5967                                                          ;****                    ****
5968
5969  030360                  ENDSUB
5970  030360                                                          L10044:
5971  030360  104403                                                  TRAP    C$ESUB
5972
5973  030362                  BGNSUB
5974  030362                                                          T6.3:
5975  030362  104402                                                  TRAP    C$BSUB
5976  030364                          CLEAR                   ;MACRO FOR MASTER CLEAR
5977                                                          ;**** MACRO EXPANSION ****
5978  030364  004737  011070          JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
5979                                                          ;****                    ****
5980
5981  030370                          ESCAPE  TST             ;IF ERROR, BR TO TEST END.
5982  030370  104410                                                  TRAP    C$ESCAPE
5983  030372  000160                                                   .WORD   L10042-.
5984  030374                          BASEIN                  ;MACRO FOR BASE IN COMMAND
5985                                                          ;**** MACRO EXPANSION ****
5986  030374  004737  011266          JSR     PC, $BASEI      ;CALL BASE IN ROUTINE WITH DEFAULTS
5987  030400  004000                  .WORD   LPLU            ;SET LINE UNIT LOOP
5988  030402  002640                  .WORD   BASE            ;BASE TABLE ADDRESS
5989  030404  000522                  .WORD   DMR             ;DMR-11 MODE
5990                                                          ;****                    ****
5991
5992  030406                          ESCAPE  TST             ;IF ERROR, BR TO TEST END.
5993  030406  104410                                                  TRAP    C$ESCAPE
5994  030410  000142                                                   .WORD   L10042-.
5995  030412                          CNTRIN  MAINT           ;MACRO FOR CONTROL IN (MAINT. MODE)
5996                                                          ;**** MACRO EXPANSION ****
5997  030412  004737  011522          JSR     PC, $CNTIN      ;CALL CONTROL IN ROUTINE
5998  030416  000400                  .WORD   MAINT           ;SEL6 - (DUPLEX, MODE)
5999                                                          ;****                    ****
6000
6001  030420                          ESCAPE  TST             ;IF ERROR, BR TO TEST END.
6002  030420  104410                                                  TRAP    C$ESCAPE
6003  030422  000130                                                   .WORD   L10042-.
6004  030424                          SHUTDN                  ;HALT
6005                                                          ;**** MACRO EXPANSION ****
6006  030424  004737  012562          JSR     PC, $HALT       ;DMR HALT ROUTINE.
6007                                                          ;****                    ****
```

```
 6008  030430                                 FSCAPE  TST             ;IF ERROR, BR TO TEST END.
 6009  030430  104410                                                                 TRAP    C$ESCAPE
 6010  030432  000120                                                                 .WORD   L10042-.
 6011  030434  132737  000002  002732         BITB    #BIT1,BASE+ISP7 ;IS THE MAINTENANCE BIT SET IN IMAGE OF SP 7.
 6012  030442  001004                         BNE     10$
 6013  030444                                 ERRDF   21,EMT12        ;ERROR - MAINT. BIT NOT SET.
 6014  030444  104455                                                                 TRAP    C$ERDF
 6015  030446  000025                                                                 .WORD   21
 6016  030450  030666                                                                 .WORD   EMT12
 6017  030452  000000                                                                 .WORD   0
 6018  030454                       10$:
 6019  030454                         ENDSUB
 6020  030454                                                                 L10045:
 6021  030454  104403                                                                 TRAP    C$ESUB
 6022
 6023  030456                         BGNSUB
 6024  030456                                                                 T6.4:
 6025  030456  104402                                                                 TRAP    C$BSUB
 6026
 6027  030460                                 CLEAR                   ;MACRO FOR MASTER CLEAR
 6028                                                                 ;**** MACRO EXPANSION ****
 6029  030460  004737  011070                 JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
 6030                                                                 ;****                 ****
 6031
 6032  030464                                 ESCAPE  TST             ;IF ERROR, BR TO TEST END.
 6033  030464  104410                                                                 TRAP    C$ESCAPE
 6034  030466  000064                                                                 .WORD   L10042-.
 6035  030470  005737  002254                 TST     D:ATURN         ;IS INTERNAL LOOPBACK REQUESTED?
 6036  030474  001004                         BNE     1$              ;IF NOT, BR
 6037  030476  052737  004000  030520         BIS     #LPLU,100$      ;SET LINE UNIT LOOPBACK.
 6038  030504  000403                         BR      2$
 6039  030506                       1$:
 6040  030506  042737  004000  030520         BIC     #LPLU,100$      ;CLEAR LINE UNIT LOOPBACK.
 6041  030514                       2$:
 6042  030514                                 CALL    $BASEI          ;BASE IN COMMAND.
 6043  030520  000000                 100$:           .WORD   0       ;MAINTENANCE BITS (L. U. LOOPBACK?)
 6044  030522  002640                           .WORD   BASE    ;BASE TABLE ADDRESS.
 6045  030524  000522                           .WORD   DMR     ;DMR MODE.
 6046  030526                                 ESCAPE  TST             ;IF ERROR, BR TO TEST END.
 6047  030526  104410                                                                 TRAP    C$ESCAPE
 6048  030530  000022                                                                 .WORD   L10042-.
 6049  030532                                 CALL    $LOOP           ;EXTENDED DMR COMMAND TO SET MAINT. BITS
 6050                                                                 ;IF NEEDED. THIS WILL ALLOW MODEM LOOPBACK
 6051                                                                 ;IF THE USER REQUESTED IT.
 6052  030536                                 ESCAPE  TST             ;IF ERROR, BR TO TEST END.
 6053  030536  104410                                                                 TRAP    C$ESCAPE
 6054  030540  000012                                                                 .WORD   L10042-.
 6055  030542                                 CNTRIN                  ;MACRO FOR CONTROL IN (FULL DUPLEX)
 6056                                                                 ;**** MACRO EXPANSION ****
 6057  030542  004737  011522                 JSR     PC, $CNTIN      ;CALL CONTROL IN ROUTINE WITH DEFAULT
 6058  030546  000000                           .WORD   0       ;SEL6 - FULL DUPLEX, RUN MODE, 1 SEC START.
 6059                                                                 ;****                 ****
 6060  030550                         ENDSUB
 6061  030550                                                                 L10046:
 6062  030550  104403                                                                 TRAP    C$FSUB
 6063
```

```
                                        ENDTST
                                                                                L10042:
030552  104401                                                                          TRAP    C$ETST

030554  042110  020130  044502  EMT9:   .ASCIZ  /HDX BIT SET WHEN IN FDX/
030562  020124  042523  020124
030570  044127  047105  044440
030576  020116  042106  000130
030604  042104  046503  020120  EMT10:  .ASCIZ  /DDCMP RUN BIT NOT SET/
030612  052522  020116  044502
030620  020124  047516  020124
030626  042523  000124
030632  042110  020130  044502  EMT11:  .ASCIZ  /HDX BIT NOT SET WHEN IN HDX/
030640  020124  047516  020124
030646  042523  020124  044127
030654  047105  044440  020116
030662  042110  000130
030666  040515  047111  027124  EMT12:  .ASCIZ  /MAINT. MODE BIT NOT SET/
030674  046440  042117  020105
030702  044502  020124  047516
030710  020124  042523  000124
                                        .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.
                        ;*
                        ;*************************************************************************
030716                  BGNTST
030716                                                          T7::

                          BGNSUB
030716                                                          T7.1:
030716  104402                                                          TRAP    C$BSUB
                                CLEAR                   ;MACRO FOR MASTER CLEAR
                                                        ;**** MACRO EXPANSION ****
030720  004737  011070        JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                        ;****                 ****

                                ESCAPE  TST             ;IF ERROR, BR TO TEST END.
030724  104410                                                  TRAP    C$ESCAPE
030726  000232                                                  .WORD   L10047-.
                                BASEIN                  ;BASE IN COMMAND.
030730                                                  ;**** MACRO EXPANSION ****
030730  004737  011266        JSR     PC, $BASEI      ;CALL BASE IN ROUTINE WITH DEFAULTS
030734  004000                .WORD   LPLU            ;SET LINE UNIT LOOP
030736  002640                .WORD   BASE            ;BASE TABLE ADDRESS
030740  000522                .WORD   DMR             ;DMR-11 MODE
                                                        ;****                 ****

030742                          ESCAPE  TST             ;IF ERROR, BR TO TEST END.
030742  104410                                                  TRAP    C$ESCAPE
030744  000214                                                  .WORD   L10047-.

030746  012701  000005        MOV     #5,R1           ;COUNTER
030752  012702  031162        MOV     #MODEM,R2       ;PATTERN TO WRITE INTO MODEM
030756                  10$:
030756  012237  030772        MOV     (R2)+,15$       ;WRITE PATTERN
030762  004737  012062        JSR     PC,$DMRIN       ;ISSUE DMR MODE COMMAND
030766  000005                .WORD   WMODEM          ;WRITE MODEM COMMNAD
030770  000377                .WORD   377             ;CLEAR ALL BITS IN BSEL6
030772  000000          15$:  .WORD   0               ;SET THE BITS IN BSEL6 (FROM PATTERN)
030774                          ESCAPE  TST             ;IF ERROR, BR TO TEST END.
030774  104410                                                  TRAP    C$ESCAPE
030776  000162                                                  .WORD   L10047-.

031000  052777  000057  151224        BIS     #RQI!RMODEM,@SEL0 ;SET RQI AND READ  MODEM COMMAND
031006                          WAIT    RDI             ;WAIT FOR RDI TO BE SET.
                                                        ;**** MACRO EXPANSION ****
031006  004737  010276        JSR     PC, $WAIT       ;CALL WAIT ROUTINE
```

```
6147  031012  00000C                          .WORD   0       ;FLAG THAT WE'RE WAITING FOR RDI
6148                                          ;****                   ****
6149  031014                          ESCAPE  TST             ;IF ERROR, EXIT TEST.
6150  031014  104410                                                          TRAP    C$ESCAPE
6151  031016  000142                                                          .WORD   L10047-.
6152  031020                  20$:
6153  031020  127737  151214  030772  CMPB    @#BSEL6,15$     ;DID THE MICROCODE COPY THE BITS?
6154  031026  001406                  BEQ     25$             ;IF YES CONTINUE
6155  031030  013703  030772          MOV     15$,R3          ;SAVE THE PATTERN FOR THE ERROR MESSAGE.
6156  031034                          ERRDF   22.,EMT13,ERRT2 ;WRITE MODEM ERROR
6157  031034  104455                                                          TRAP    C$ERDF
6158  031036  000026                                                          .WORD   22
6159  031040  031226                                                          .WORD   EMT13
6160  031042  031174                                                          .WORD   ERRT2
6161  031044                  25$:
6162  031044                          WAIT    RQI             ;CLEAR RQI AND WAIT FOR RDI TO CLEAR.
6163                                                          ;**** MACRO EXPANSION ****
6164  031044  004737  010706          JSR     PC, $CLRQI      ;CLEAR RQI AND WAIT FOR IT TO BE CLEARED.
6165                                          ;****                   ****
6166  031050                          ESCAPE  TST             ;IF ERROR, EXIT TEST.
6167  031050  104410                                                          TRAP    C$ESCAPE
6168  031052  000106                                                          .WORD   L10047-.
6169  031054  005301                  DEC     R1              ;DECREMENT COUNTER
6170  031056  001337                  BNE     10$             ;CONTINUE UNTIL ALL 5 PATTERNS TRIED.
6171  031060                  30$:
6172
6173  031060                    ENDSUB
6174  031060                                                                  L10050:
6175  031060  104403                                                          TRAP    C$ESUB
6176
6177  031062                    BGNSUB
6178  031062                                                                  T7.2:
6179  031062  104402                                                          TRAP    C$BSUB
6180
6181  031064                          DMRIN   WMODEM,377,21   ;ATTEMPT TO WRITE MODEM HDX AND RTS.
6182                                                          ;**** MACRO EXPANSION ****
6183  031064  004737  012062          JSR     PC, $DMRIN      ;CALL DMR MODE INPUT ROUTINE
6184  031070  000005                  .WORD   WMODEM          ;INPUT COMMAND
6185  031072  000377                  .WORD   377             ;SEL4 VALUE (OR BITS TO CLEAR IN BSEL6)
6186  031074  000021                  .WORD   21              ;SEL6 VALUE (OR BITS TO SET IN BSEL6)
6187                                                          ;****                   ****
6188
6189  031076                          ESCAPE  TST             ;IF ERROR, BR TO END.
6190  031076  104410                                                          TRAP    C$ESCAPE
6191  031100  000060                                                          .WORD   L10047-.
6192  031102  052777  000057  151122  BIS     #RQI!RMODEM,@#SEL0 ;SET RQI AND READ MODEM COMMAND.
6193  031110                          WAIT    RDI             ;WAIT FOR RDI TO BE SET
6194                                                          ;**** MACRO EXPANSION ****
6195  031110  004737  010276          JSR     PC, $WAIT       ;CALL WAIT ROUTINE
6196  031114  000000                  .WORD   0               ;FLAG THAT WE'RE WAITING FOR RDI
6197                                          ;****                   ****
6198  031116                          ESCAPE  TST             ;IF ERROR, EXIT TEST.
6199  031116  104410                                                          TRAP    C$ESCAPE
6200  031120  000040                                                          .WORD   L10047-.
6201
6202  031122  122777  000020  151110  CMPB    #20,@#BSEL6     ;IS ONLY HDX SET?
```

```
6203  031130  001406                          BEQ     10$             ;IF YES - OK
6204  031132  012703  000021                  MOV     #21,R3          ;SAVE THE PATTERN FOR THE ERROR MESSAGE.
6205  031136                                  ERRDF   22,EMT13,ERRT2
6206  031136  104455                                                                  TRAP    C$ERDF
6207  031140  000026                                                                  .WORD   22
6208  031142  031226                                                                  .WORD   EMT13
6209  031144  031174                                                                  .WORD   ERRT2
6210  031146                          10$:
6211  031146                                  WAIT    RQI             ;CLEAR RQI AND WAIT FOR RDI TO CLEAR.
6212                                                                  ;**** MACRO EXPANSION ****
6213  031146  004737  010706                  JSR     PC, $CLRQI      ;CLEAR RQI AND WAIT FOR IT TO BE CLEARED.
6214                                                                  ;****                   ****
6215  031152                                  SHUTDN
6216                                                                  ;**** MACRO EXPANSION ****
6217  031152  004737  012562                  JSR     PC, $HALT       ;DMR HALT ROUTINE.
6218                                                                  ;****                   ****
6219
6220  031156                            ENDSUB
6221  031156                                                                  L10051:
6222  031156  104403                                                                 TRAP    C$ESUB
6223
6224  031160                          ENDTST
6225  031160                                                                  L10047:
6226  031160  104401                                                                 TRAP    C$ETST
6227
6228  031162  000000  000376  000001  MODEM:  .WORD   0,376,1,252,357 ;PATTERN TO WRITE INTO MODEM
6229  031170  000252  000357
6230
6231  031174                          BGNMSG  ERRT2
6232  031174                                                                  ERRT2::
6233  031174                                  PRINTB  #FMT19,R3,<B,@BSEL6>
6234  031174  005046                                                                 CLR     -(SP)
6235  031176  157716  151036                                                         BISB    @BSEL6,(SP)
6236  031202  010346                                                                 MOV     R3,-(SP)
6237  031204  012746  031252                                                         MOV     #FMT19,-(SP)
6238  031210  012746  000003                                                         MOV     #3,-(SP)
6239  031214  010600                                                                 MOV     SP,R0
6240  031216  104414                                                                 TRAP    C$PNTB
6241  031220  062706  000010                                                         ADD     #10,SP
6242  031224                          ENDMSG
6243  031224                                                                  L10052:
6244  031224  104423                                                                 TRAP    C$MSG
6245
6246
6247  031226  051127  052111  020105  EMT13:  .ASCIZ  /WRITE MODEM ERROR /
6248  031234  047515  042504  020115
6249  031242  051105  047522  020122
6250  031250     000
6251          031252                          .EVEN
6252
6253  031252  040445  051127  052117  FMT19:  .ASCIZ  /%AWROTE IN BSEL6: %03%A  MODEM FORMAT IN BSEL6: %03%N/
6254  031260  020105  047111  041040
6255  031266  042523  033114  020072
6256  031274  047445  022463  020101
6257  031302  046440  042117  046505
6258  031310  043040  051117  040515
```

```
6259  031316  020124  047111  041040
6260  031324  042523  033114  020072
6261  031332  047445  022463  000116
6262                                  .EVEN
6263
6264
6265
```

```
                        .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.
                        ;*****************************************************************
031340                  BGNTST
                                                                        T8::
031340
                          BGNSUB
                                                                        T8.1:
031340  104402                                                                TRAP    C$BSUB
031342                          CLEAR                   ;MACRO FOR MASTER CLEAR
                                                        ;**** MACRO EXPANSION ****
031342  004737  011070            JSR     PC, $MSCLR    ;ISSUE A DMR MASTER CLEAR
                                                        ;****                 ****

031346                          ESCAPE  TST             ;IF ERROR, BR TO TEST END.
031346  104410                                                        TRAP    C$ESCAPE
031350  000416                                                        .WORD   L10053-.
031352                          BASEIN                  ;MACRO FOR BASE IN COMMAND
                                                        ;**** MACRO EXPANSION ****
031352  004737  011266            JSR     PC, $BASEI    ;CALL BASE IN ROUTINE WITH DEFAULTS
031356  004000                            .WORD   LPLU    ;SET LINE UNIT LOOP
031360  002640                            .WORD   BASE    ;BASE TABLE ADDRESS
031362  000522                            .WORD   DMR     ;DMR-11 MODE
                                                        ;****                 ****

031364                          ESCAPE  TST             ;IF ERROR, BR TO TEST END.
031364  104410                                                        TRAP    C$ESCAPE
031366  000400                                                        .WORD   L10053-.
031370                          CNTRIN  MAINT           ;MACRO FOR CONTROL IN (FULL DUPLEX AND MAINT)
                                                        ;**** MACRO EXPANSION ****
031370  004737  011522            JSR     PC, $CNTIN    ;CALL CONTROL IN ROUTINE
031374  000400                            .WORD   MAINT   ;SEL6 - (DUPLEX, MODE)
                                                        ;****                 ****

031376                          ESCAPE  TST             ;IF ERROR, BR TO TEST END.
031376  104410                                                        TRAP    C$ESCAPE
031400  000366                                                        .WORD   L10053-.

                                                        ;SET THRESHOLDS:
                                                        ;NAKS RCVD = 377
                                                        ;NAKS SENT = 377
                                                        ;REP SENT = 377
                                                        ;NO BUFFER = 3
031402                          DMRIN   THRESH,177777,1777
                                                        ;**** MACRO EXPANSION ****
031402  004737  012062            JSR     PC, $DMRIN    ;CALL DMR MODE INPUT ROUTINE
031406  000013                            .WORD   THRESH  ;INPUT COMMAND
```

```
6322  031410  177777                          .WORD   177777  ;SEL4 VALUE (OR BITS TO CLEAR IN BSEL6)
6323  031412  001777                          .WORD   1777    ;SEL6 VALUE (OR BITS TO SET IN BSEL6)
6324                                          ;****                   ****
6325
6326  031414                          ESCAPE  TST             ;IF ERROR, BR TO TEST END.
6327  031414  104410                                                          TRAP    C$ESCAPE
6328  031416  000350                                                          .WORD   L10053-.
6329  031420  012700  000003          1$:     MOV     #3,R0           ;SET UP A COUNTER
6330  031424
6331  031424                          BACCIT                  ;BA/CC IN COMMAND FOR TRANSMIT
6332                                          ;**** MACRO EXPANSION ****
6333  031424  004737  012272                  JSR     PC, $BACC       ;CALL BA/CC IN ROUTINE WITH DEFAULTS
6334  031430  000040                          .WORD   RQI!BACCT       ;BA/CC IN TRANSMIT COMMAND
6335  031432  002522                          .WORD   TBUF    ;TRANSMIT BUFFER ADDRESS
6336  031434  000044                          .WORD   TCOUNT  ;TRANSMIT CHARACTER COUNT
6337                                          ;****                   ****
6338
6339  031436                          WAIT    RDO             ;WAIT FOR RDO TO BE SET
6340                                          ;**** MACRO EXPANSION ****
6341  031436  004737  010276                  JSR     PC, $WAIT       ;CALL WAIT ROUTINE
6342  031442  000001                          .WORD   1       ;FLAG THAT WE'RE WAITING FOR RDO
6343                                          ;****                   ****
6344  031444                          ESCAPE  TST             ;IF RDO NOT SET, BR TO TEST END.
6345  031444  104410                                                          TRAP    C$ESCAPE
6346  031446  000320                                                          .WORD   L10053-.
6347  031450  005300                          DEC     R0              ;DEC COUNTER
6348  031452  001404                          BEQ     10$             ;TRANSMIT FOR 3 TIMES.
6349  031454  042777  000207  150552          BIC     #RDO!CMD,@SEL2  ;CLEAR BACC OUT TRANSMIT.
6350  031462  000760                          BR      1$              ;TRANSMIT AGAIN
6351  031464                          10$:
6352  031464  032777  000001  150542          BIT     #CNTRL,@SEL2    ;IS THIS A CONTROL OUT?
6353  031472  001005                          BNE     20$             ;IF YES, PROCEED.
6354  031474                          ERRDF   8,EMG8,ERRG2    ;EXPECTED CONTROL OUT NOT RECEIVED.
6355  031474  104455                                                          TRAP    C$ERDF
6356  031476  000010                                                          .WORD   8
6357  031500  017774                                                          .WORD   EMG8
6358  031502  015124                                                          .WORD   ERRG2
6359  031504  000410                          BR      30$             ;EXIT
6360  031506                          20$:
6361  031506  032777  000004  150524          BIT     #NOBFR,@SEL6    ;IS THE NO BUFFER FLAG SET?
6362  031514  001004                          BNE     30$             ;IF YES - OK, PROCEED.
6363  031516                          ERRDF   9,EMG9,ERRG2    ;WE'RE NOT GETTING EXPECTED RESULT
6364  031516  104455                                                          TRAP    C$ERDF
6365  031520  000011                                                          .WORD   9
6366  031522  020040                                                          .WORD   EMG9
6367  031524  015124                                                          .WORD   ERRG2
6368                                          ;(EITHER CONTROL OUT OR NOBUF/NAKS)
6369  031526                          30$:
6370  031526  042777  000207  150500          BIC     #RDO!CMD,@SEL2  ;CLEAR CONTROL OUT
6371  031534                          WAIT    RDO             ;EXPECT ANOTHER BACC OUT.
6372                                          ;**** MACRO EXPANSION ****
6373  031534  004737  010276                  JSR     PC, $WAIT       ;CALL WAIT ROUTINE
6374  031540  000001                          .WORD   1       ;FLAG THAT WE'RE WAITING FOR RDO
6375                                          ;****                   ****
6376  031542                          ESCAPE  TST             ;IF ERROR, BR TO END.
6377  031542  104410                                                          TRAP    C$ESCAPE
```

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6378  031544  000222                                                                  .WORD   L10053-.
6379  031546  042777  000207  150460          BIC     #RDO!CMD,@SEL2  ;CLEAR BACC OUT.
6380  031554                                  SHUTDN                  ;HALT DMR
6381                                                                  ;**** MACRO EXPANSION ****
6382  031554  004737  012562                  JSR     PC, $HALT       ;DMR HALT ROUTINE.
6383                                                                  ;****                 ****
6384  031560                          50$:
6385  031560                            ENDSUB
6386  031560                                                                L10054:
6387  031560  104403                                                               TRAP    C$ESUB
6388
6389  031562                            BGNSUB
6390  031562                                                                T8.2:
6391  031562  104402                                                               TRAP    C$BSUB
6392  031564                                  CLEAR                   ;MACRO FOR MASTER CLEAR
6393                                                                  ;**** MACRO EXPANSION ****
6394  031564  004737  011070                  JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
6395                                                                  ;****                 ****
6396
6397  031570                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
6398  031570  104410                                                               TRAP    C$ESCAPE
6399  031572  000174                                                               .WORD   L10053-.
6400  031574                                  BASEIN                  ;MACRO FOR BASE IN COMMAND
6401                                                                  ;**** MACRO EXPANSION ****
6402  031574  004737  011266                  JSR     PC, $BASEI      ;CALL BASE IN ROUTINE WITH DEFAULTS
6403  031600  004000                                  .WORD   LPLU    ;SET LINE UNIT LOOP
6404  031602  002640                                  .WORD   BASE    ;BASE TABLE ADDRESS
6405  031604  000522                                  .WORD   DMR     ;DMR-11 MODE
6406                                                                  ;****                 ****
6407
6408  031606                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
6409  031606  104410                                                               TRAP    C$ESCAPE
6410  031610  000156                                                               .WORD   L10053-.
6411  031612                                  CNTRIN                  ;MACRO FOR CONTROL IN (FULL DUPLEX)
6412                                                                  ;**** MACRO EXPANSION ****
6413  031612  004737  011522                  JSR     PC, $CNTIN      ;CALL CONTROL IN ROUTINE WITH DEFAULT
6414  031616  000000                                  .WORD   0       ;SEL6 - FULL DUPLEX, RUN MODE, 1 SEC START.
6415                                                                  ;****                 ****
6416
6417  031620                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
6418  031620  104410                                                               TRAP    C$ESCAPE
6419  031622  000144                                                               .WORD   L10053-.
6420
6421                                                                  ;SET THRESHOLDS:
6422                                                                  ;NAKS RCVD = 3
6423                                                                  ;NAKS SENT = 3
6424                                                                  ;REP SENT = 377
6425                                                                  ;NO BUFFER = 7
6426  031624                                  DMRIN   THRESH,1403,3777
6427                                                                  ;**** MACRO EXPANSION ****
6428  031624  004737  012062                  JSR     PC, $DMRIN      ;CALL DMR MODE INPUT ROUTINE
6429  031630  000013                                  .WORD   THRESH  ;INPUT COMMAND
6430  031632  001403                                  .WORD   1403    ;SEL4 VALUE (OR BITS TO CLEAR IN BSEL6)
6431  031634  003777                                  .WORD   3777    ;SEL6 VALUE (OR BITS TO SET IN BSEL6)
6432                                                                  ;****                 ****
6433
```

```
6434  031636                                ESCAPE  TST             ;IF ERROR, BR TO TEST END.
6435  031636  104410                                                                TRAP    C$ESCAPE
6436  031640  000126                                                                .WORD   L10053-.
6437  031642                                BACCIT                  ;BA/CC IN COMMAND FOR TRANSMIT
6438                                                                ;**** MACRO EXPANSION ****
6439  031642  004737  012272                JSR     PC, $BACC       ;CALL BA/CC IN ROUTINE WITH DEFAULTS
6440  031646  000040                        .WORD   RQI!BACCT       ;BA/CC IN TRANSMIT COMMAND
6441  031650  002522                        .WORD   TBUF    ;TRANSMIT BUFFER ADDRESS
6442  031652  000044                        .WORD   TCOUNT  ;TRANSMIT CHARACTER COUNT
6443                                                                ;****                   ****
6444  031654                          10$:
6445  031654                                WAIT    RDO             ;WAIT FOR RDO TO BE SET
6446                                                                ;**** MACRO EXPANSION ****
6447  031654  004737  010276                JSR     PC, $WAIT       ;CALL WAIT ROUTINE
6448  031660  000001                        .WORD   1       ;FLAG THAT WE'RE WAITING FOR RDO
6449                                                                ;****                   ****
6450  031662                                ESCAPE  TST             ;IF RDO NOT SET, BR TO TEST END.
6451  031662  104410                                                                TRAP    C$ESCAPE
6452  031664  000102                                                                .WORD   L10053-.
6453  031666  032777  000001  150340        BIT     #CNTRL,@SEL2    ;IS THIS A CONTROL OUT?
6454  031674  001005                        BNE     20$             ;IF YES, PROCEED.
6455  031676                                ERRDF   8,EMG8,ERRG2    ;EXPECTED CONTROL OUT NOT RECEIVED.
6456  031676  104455                                                                TRAP    C$ERDF
6457  031700  000010                                                                .WORD   8
6458  031702  017774                                                                .WORD   EMG8
6459  031704  015124                                                                .WORD   ERRG2
6460  031706  000410                        BR      30$             ;EXIT
6461  031710                          20$:
6462  031710  032777  000004  150322        BIT     #NOBFR,@SEL6    ;IS THE NO BUFFER FLAG SET?
6463  031716  001004                        BNE     30$             ;IF YES - OK, PROCEED.
6464  031720                                ERRDF   9,EMG9,ERRG2    ;WE'RE NOT GETTING EXPECTED RESULT
6465  031720  104455                                                                TRAP    C$ERDF
6466  031722  000011                                                                .WORD   9
6467  031724  020040                                                                .WORD   EMG9
6468  031726  015124                                                                .WORD   ERRG2
6469                                                                ;(EITHER CONTROL OUT OR NOBUF/NAKS)
6470  031730                          30$:
6471  031730                                SHUTDN
6472                                                                ;**** MACRO EXPANSION ****
6473  031730  004737  012562                JSR     PC, $HALT       ;DMR HALT ROUTINE.
6474                                                                ;****                   ****
6475  031734  123727  002643  000003        CMPB    BASE+3,#3       ;NAKS REC. - NO BUFFER = 3?
6476  031742  001004                        BNE     35$             ;IF NOT ERROR
6477  031744  123727  002646  000003        CMPB    BASE+6,#3       ;NAKS SENT - NO BUFFER - 3?
6478  031752  001404                        BEQ     40$             ;IF OK - SKIP.
6479  031754                          35$:
6480  031754                                ERRDF   23,EMT20,ERRT4
6481  031754  104455                                                                TRAP    C$ERDF
6482  031756  000027                                                                .WORD   23
6483  031760  032026                                                                .WORD   EMT20
6484  031762  031770                                                                .WORD   ERRT4
6485
6486  031764                          40$:
6487  031764                            ENDSUB
6488  031764                                                                L10055:
6489  031764  104403                                                                TRAP    C$ESUB
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6490  031766                          ENDTST
6491  031766                                                          L10053:
6492  031766  104401                                                          TRAP    C$ETST
6493
6494
6495  031770                          BGNMSG  ERRT4
6496  031770                                                          ERRT4::
6497  031770                                  PPINTB  #FMG7,<B,BASE+3>,<B,BASE+6>
6498  031770  005046                                                          CLR     -(SP)
6499  031772  153716  002646                                                  BISB    BASE+6,(SP)
6500  031776  005046                                                          CLR     -(SP)
6501  032000  153716  002643                                                  BISB    BASE+3,(SP)
6502  032004  012746  016522                                                  MOV     #FMG7,-(SP)
6503  032010  012746  000003                                                  MOV     #3,-(SP)
6504  032014  010600                                                          MOV     SP,R0
6505  032016  104414                                                          TRAP    C$PNTB
6506  032020  062706  000010                                                  ADD     #10,SP
6507  032024                          ENDMSG
6508  032024                                                          L10056:
6509  032024  104423                                                          TRAP    C$MSG
6510
6511  032026  040516  051513  042440  EMT20:  .ASCIZ  /NAKS ERROR/
6512  032034  051122  051117     000
6513          032042                  .EVEN
6514
```

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

                                ;*****************************************************************************
                                ;*              TEST 9 - DMR-11
                                ;* NON-EXISTENT MEMORY (NXM) ERROR CHECK
                                ;* PERFORM DMR COMMANDS USING NXM ADDRESSES; VERIFY THAT NXM ERROR IS
                                ;* REPORTED IN EACH OF THE FOLLOWING SUBTESTS:
                                ;*  SUBTEST 1  -  BASE IN RESUME COMMAND - BASE TABLE ADDRESS IS NXM
                                ;*  SUBTEST 2  -  BA/CC IN RECEIVE COMMAND - BA/CC IN ADDRESS IS NXM
                                ;*  SUBTEST 3  -  BA/CC IN TRANSMIT COMMAND - BA/CC IN ADDRESS IS NXM
                                ;*
                                ;*****************************************************************************
032042                          BGNTST
032042                                                                  T9::
032042                            BGNSUB
032042                                                                  T9.1:
032042  104402                                                                  TRAP    C$BSUB
032044                                CLEAR                   ;MASTER CLEAR MACRO
                                                              ;**** MACRO EXPANSION ****
032044  004737  011070                JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                              ;****                ****
032050                                ESCAPE  TST             ;IF ERROR, BR TO TEST END
032050  104410                                                                    TRAP    C$ESCAPE
032052  000500                                                                    .WORD   L10057-.
032054                                BASEIN                  ;BASE IN COMMAND - DMR MODE
                                                              ;**** MACRO EXPANSION ****
032054  004737  011266                JSR     PC, $BASEI      ;CALL BASE IN ROUTINE WITH DEFAULTS
032060  004000                                .WORD   LPLU    ;SET LINE UNIT LOOP
032062  002640                                .WORD   BASE    ;BASE TABLE ADDRESS
032064  000522                                .WORD   DMR     ;DMR-11 MODE
                                                              ;****                ****

032066                                ESCAPE  TST             ;IF ERROR, BR TO TEST END
032066  104410                                                                    TRAP    C$ESCAPE
032070  000462                                                                    .WORD   L10057-.
032072                                SHUTDN                  ;HALT
                                                              ;**** MACRO EXPANSION ****
032072  004737  012562                JSR     PC, $HALT       ;DMR HALT ROUTINE.
                                                              ;****                ****
032076                                ESCAPE  TST             ;IF ERROR, BR TO TEST END.
032076  104410                                                                    TRAP    C$ESCAPE
032100  000452                                                                    .WORD   L10057-.
032102  012737  000001  002366        MOV     #CNTRL,ERROR    ;THIS FLAG WILL INHIBIT CONTROL OUT
                                                              ;ERROR REPORTING - BECAUSE WE EXPECT ONE.

                                                              ;BASE IN RESUME COMMAND WITH NXM BASE TABLE.
032110                                BASEIN  0,160000,BIT15!BIT14!RES!DMR
                                                              ;**** MACRO EXPANSION ****
032110  004737  011266                JSR     PC, $BASEI      ;CALL BASE IN ROUTINE
032114  000000                                .WORD   0       ;MAINTENANCE MODE BITS TO SET IN BSEL1
032116  160000                                .WORD   160000  ;BASE TABLE ADDRESS
032120  150522                                .WORD   BIT15!BIT14!RES!DMR     ;MODE
                                                              ;****                ****

032122                                WAIT    RDO             ;WAIT FOR RDO TO BE SET
```

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6571
6572  032122  004737  010276          JSR     PC, $WAIT       ;**** MACRO EXPANSION ****
6573  032126  000001                  .WORD   1               ;CALL WAIT ROUTINE
6574                                                          ;FLAG THAT WE'RE WAITING FOR RDO
6575  032130  032777  000001  150076  BIT     #CNTRL,@SEL2    ;****                    ****
6576  032136  001005                  BNE     10$             ;IS THERE A CONTROL OUT REPORTED ?
6577  032140                          ERRDF   8,EMG8,ERRG2    ;IF YES, PROCEED.
6578  032140  104455                                          ;EXPECTED CONTROL OUT
6579  032142  000010                                                  TRAP    C$ERDF
6580  032144  017774                                                  .WORD   8
6581  032146  015124                                                  .WORD   EMG8
6582  032150  000410                  BR      20$             ;EXIT   .WORD   ERRG2
6583  032152                  10$:
6584  032152  032777  000400  150060  BIT     #NXM,@SEL6      ;IS THE NXM FLAG SET?
6585  032160  001004                  BNE     20$             ;IF YES - ERROR REPORTED CORRECTLY
6586  032162                          ERRDF   9,EMG9,ERRG2    ;UNEXPECTED CONTROL OUT RECEIVED
6587  032162  104455                                                  TRAP    C$ERDF
6588  032164  000011                                                  .WORD   9
6589  032166  020040                                                  .WORD   EMG9
6590  032170  015124                                                  .WORD   ERRG2
6591  032172                  20$:
6592  032172  042777  000207  150034  BIC     #RDO!CMD,@SEL2  ;CLEAR RDO AND THE COMMAND BITS
6593  032200  005037  002366          CLR     ERROR           ;ALLOW ERROR REPORTING
6594  032204                  ENDSUB
6595  032204                                                          L10060:
6596  032204  104403                                                  TRAP    C$ESUB
6597
6598  032206                  BGNSUB
6599  032206                                                          T9.2:
6600  032206  104402                                                  TRAP    C$BSUB
6601  032210                  CLEAR                           ;MACRO FOR MASTER CLEAR
6602                                                          ;**** MACRO EXPANSION ****
6603  032210  004737  011070  JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
6604                                                          ;****                    ****
6605
6606  032214                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
6607  032214  104410                                                  TRAP    C$ESCAPE
6608  032216  000334                                                  .WORD   L10057-.
6609  032220                  BASEIN                          ;MACRO FOR BASE IN COMMAND
6610                                                          ;**** MACRO EXPANSION ****
6611  032220  004737  011266  JSR     PC, $BASEI      ;CALL BASE IN ROUTINE WITH DEFAULTS
6612  032224  004000          .WORD   LPLU            ;SET LINE UNIT LOOP
6613  032226  002640          .WORD   BASE            ;BASE TABLE ADDRESS
6614  032230  000522          .WORD   DMR             ;DMR-11 MODE
6615                                                          ;****                    ****
6616
6617  032232                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
6618  032232  104410                                                  TRAP    C$ESCAPE
6619  032234  000316                                                  .WORD   L10057-.
6620  032236                  CNTRIN                          ;MACRO FOR CONTROL IN (FULL DUPLEX)
6621                                                          ;**** MACRO EXPANSION ****
6622  032236  004737  011522  JSR     PC, $CNTIN      ;CALL CONTROL IN ROUTINE WITH DEFAULT
6623  032242  000000          .WORD   0               ;SEL6 - FULL DUPLEX, RUN MODE, 1 SEC START.
6624                                                          ;****                    ****
6625
6626  032244                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
```

```
6627  032244  10441C                                                          TRAP    C$ESCAPE
6628  032246  000304                                                          .WORD   L10057-.
6629  032250  012737  000001  002366          MOV     #CNTRL,ERROR    ;INHIBIT CONTROL OUT ERROR REPORTING AGAIN.
6630
6631                                                  ;BA/CC IN REC. COMMAND WITH NXM
6632                                                  ;ADDR = 760000 AND A CHARACTER COUNT = 3.
6633  032256                          BACCIR  160000,BIT15!BIT14!RCOUNT
6634                                                  ;**** MACRO EXPANSION ****
6635  032256  004737  012272                  JSR     PC, $BACC       ;CALL BA/CC IN ROUTINE
6636  032262  000044                                  .WORD   RQI!BACCR       ;BA/CC IN RECEIVE COMMAND
6637  032264  160000                                  .WORD   160000  ;BUFFER ADDRESS BITS 0-15
6638  032266  140044                                  .WORD   BIT15!BIT14!RCOUNT      ;BA BITS 16/17 AND CHAR. COUNT
6639                                                  ;****                   ****
6640
6641  032270                          BACCIT                          ;BA/CC IN XMIT
6642                                                  ;**** MACRO EXPANSION ****
6643  032270  004737  012272                  JSR     PC, $BACC       ;CALL BA/CC IN ROUTINE WITH DEFAULTS
6644  032274  000040                                  .WORD   RQI!BACCT       ;BA/CC IN TRANSMIT COMMAND
6645  032276  002522                                  .WORD   TBUF    ;TRANSMIT BUFFER ADDRESS
6646  032300  000044                                  .WORD   TCOUNT  ;TRANSMIT CHARACTER COUNT
6647                                                  ;****                   ****
6648
6649  032302                          WAIT    RDO             ;WAIT FOR RDO
6650                                                  ;**** MACRO EXPANSION ****
6651  032302  004737  010276                  JSR     PC, $WAIT       ;CALL WAIT ROUTINE
6652  032306  000001                                  .WORD   1       ;FLAG THAT WE'RE WAITING FOR RDO
6653                                                  ;****                   ****
6654  032310  032777  000001  147716          BIT     #CNTRL,@SEL2    ;IS THERE A CONTROL OUT REPORTED ?
6655  032316  001005                          BNE     10$             ;IF YES, PROCEED.
6656  032320                                  ERRDF   8,EMG8,ERRG2    ;EXPECTED CONTROL OUT
6657  032320  104455                                                          TRAP    C$ERDF
6658  032322  000010                                                          .WORD   8
6659  032324  017774                                                          .WORD   EMG8
6660  032326  015124                                                          .WORD   ERRG2
6661  032330  000410                          BR      20$             ;EXIT
6662  032332                          10$:
6663  032332  032777  000400  147700          BIT     #NXM,@SEL6      ;IS THE NXM FLAG SET?
6664  032340  001004                          BNE     20$             ;IF YES - ERROR REPORTED CORRECTLY
6665  032342                                  ERRDF   9,EMG9,ERRG2    ;UNEXPECTED CONTROL OUT RECEIVED
6666  032342  104455                                                          TRAP    C$ERDF
6667  032344  000011                                                          .WORD   9
6668  032346  020040                                                          .WORD   EMG9
6669  032350  015124                                                          .WORD   ERRG2
6670
6671  032352                          20$:
6672  032352  042777  000207  147654          BIC     #RDO.CMD,@SEL2  ;CLEAR RDO AND THE COMMAND BITS.
6673  032360  005037  002366                  CLR     ERROR           ;ENABLE ERROR REPORTING
6674  032364                            ENDSUB
6675  032364                                                                  L10061:
6676  032364  104403                                                          TRAP    C$ESUB
6677
6678  032366                            BGNSUB
6679  032366                                                                  T9.3:
6680  032366  104402                                                          TRAP    C$BSUB
6681  032370                                  CLEAR                   ;MACRO FOR MASTER CLEAR
6682                                                  ;**** MACRO EXPANSION ****
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```
6683  032370  004737  011070                JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
6684                                                                  ;****                   ****
6685
6686  032374                                ESCAPE  TST             ;IF ERROR, BR TO TEST END.
6687  032374  104410                                                                TRAP    C$ESCAPE
6688  032376  000154                                                                .WORD   L10057-.
6689  032400                                BASEIN                  ;MACRO FOR BASE IN COMMAND
6690                                                                  ;**** MACRO EXPANSION ****
6691  032400  004737  011266                JSR     PC, $BASEI      ;CALL BASE IN ROUTINE WITH DEFAULTS
6692  032404  004000                                .WORD   LPLU    ;SET LINE UNIT LOOP
6693  032406  002640                                .WORD   BASE    ;BASE TABLE ADDRESS
6694  032410  000522                                .WORD   DMR     ;DMR-11 MODE
6695                                                                  ;****                   ****
6696
6697  032412                                ESCAPE  TST             ;IF ERROR, BR TO TEST END.
6698  032412  104410                                                                TRAP    C$ESCAPE
6699  032414  000136                                                                .WORD   L10057-.
6700  032416                                CNTRIN                  ;MACRO FOR CONTROL IN (FULL DUPLEX)
6701                                                                  ;**** MACRO EXPANSION ****
6702  032416  004737  011522                JSR     PC, $CNTIN      ;CALL CONTROL IN ROUTINE WITH DEFAULT
6703  032422  000000                                .WORD   0       ;SEL6 - FULL DUPLEX, RUN MODE, 1 SEC START.
6704                                                                  ;****                   ****
6705
6706  032424                                ESCAPE  TST             ;IF ERROR, BR TO TEST END.
6707  032424  104410                                                                TRAP    C$ESCAPE
6708  032426  000124                                                                .WORD   L10057-.
6709  032430                                BACCIR                  ;BA/CC IN RCV
6710                                                                  ;**** MACRO EXPANSION ****
6711  032430  004737  012272                JSR     PC, $BACC       ;CALL BA/CC IN ROUTINE WITH DEFAULTS
6712  032434  000044                                .WORD   RQI!BACCR       ;BA/CC IN RECEIVE COMMAND
6713  032436  002572                                .WORD   RBUF    ;RECEIVE BUFFER
6714  032440  000044                                .WORD   RCOUNT  ;RECEIVE CHARACTER COUNT
6715                                                                  ;****                   ****
6716
6717  032442                                ESCAPE  TST             ;IF ERROR, BR TO TEST END.
6718  032442  104410                                                                TRAP    C$ESCAPE
6719  032444  000106                                                                .WORD   L10057-.
6720  032446  012737  000001  002366        MOV     #CNTRL,ERROR    ;INHIBIT CONTROL OUT ERROR REPORTING AGAIN.
6721
6722                                                                  ;BA/CC IN XMIT COMMAND WITH NXM BUFFER
6723                                                                  ;ADDRESS (760000) AND A CHAR. COUNT = 1
6724  032454                                BACCIT  160000,BIT15!BIT14!1
6725                                                                  ;**** MACRO EXPANSION ****
6726  032454  004737  012272                JSR     PC, $BACC       ;CALL BA/CC IN ROUTINE
6727  032460  000040                                .WORD   RQI!BACCT       ;BA/CC IN TRANSMIT COMMAND
6728  032462  160000                                .WORD   160000  ;BUFFER ADDRESS BITS 0-15
6729  032464  140001                                .WORD   BIT15!BIT14!1   ;BA BITS 16 & 17 AND CHAR. COUNT
6730                                                                  ;****                   ****
6731
6732  032466                                WAIT    RDO             ;WAIT FOR RDO TO BE SET.
6733                                                                  ;**** MACRO EXPANSION ****
6734  032466  004737  010276                JSR     PC, $WAIT       ;CALL WAIT ROUTINE
6735  032472  000001                                .WORD   1       ;FLAG THAT WE'RE WAITING FOR RDO
6736                                                                  ;****                   ****
6737  032474  032777  000001  147532        BIT     #CNTRL,@SEL2    ;IS THERE A CONTROL OUT REPORTED ?
6738  032502  001005                        BNE     10$             ;IF YES, PROCEED.
```

```
6739  032504                                ERRDF   8,EMG8,ERRG2    ;EXPECTED CONTROL OUT
6740  032504  104455                                                                TRAP    C$ERDF
6741  032506  000010                                                                .WORD   8
6742  032510  017774                                                                .WORD   EMG8
6743  032512  015124                                                                .WORD   ERRG2
6744  032514  000410                        BR      20$             ;EXIT
6745  032516                        10$:
6746  032516  032777  000400  147514        BIT     #NXM,@SEL6      ;IS THE NXM FLAG SET?
6747  032524  001004                        BNE     20$             ;IF YES - ERROR REPORTED CORRECTLY
6748  032526                                ERRDF   9,EMG9,ERRG2    ;UNEXPECTED CONTROL OUT RECEIVED
6749  032526  104455                                                                TRAP    C$ERDF
6750  032530  000011                                                                .WORD   9
6751  032532  020040                                                                .WORD   EMG9
6752  032534  015124                                                                .WORD   ERRG2
6753  032536                        20$:
6754  032536  042777  000207  147470        BIC     #RDO!CMD,@SEL2  ;CLEAR RDO AND THE COMMAND BITS.
6755  032544  005037  002366                CLR     ERROR           ;DON'T INHIBIT CONTROL OUT ERRORS
6756  032550                          ENDSUB
6757  032550                                                                L10062:
6758  032550  104403                                                                TRAP    C$ESUB
6759
6760  032552                        ENDTST
6761  032552                                                                L10057:
6762  032552  104401                                                                TRAP    C$ETST
6763
6764
6765
6766
6767
6768
```

```
                                .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.
                                ;*
                                ;*******************************************************************************
032554                          BGNTST
032554                                                                          T10::
032554                                  CLEAR                   ;MACRO FOR MASTER CLEAR
                                                                ;**** MACRO EXPANSION ****
032554  004737  011070                  JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                                ;****                   ****

032560                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
032560  104410                                                                  TRAP    C$ESCAPE
032562  000214                                                                  .WORD   L10063-.
032564                                  BASEIN                  ;MACRO FOR BASE IN COMMAND
                                                                ;**** MACRO EXPANSION ****
032564  004737  011266                  JSR     PC, $BASEI      ;CALL BASE IN ROUTINE WITH DEFAULTS
032570  004000                          .WORD   LPLU            ;SET LINE UNIT LOOP
032572  002640                          .WORD   BASE            ;BASE TABLE ADDRESS
032574  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)
032576                          DMRIN   THRESH,177777,177401
                                                                ;**** MACRO EXPANSION ****
032576  004737  012062          JSR     PC, $DMRIN              ;CALL DMR MODE INPUT ROUTINE
032602  000013                  .WORD   THRESH                  ;INPUT COMMAND
032604  177777                  .WORD   177777                  ;SEL4 VALUE (OR BITS TO CLEAR IN BSEL6)
032606  177401                  .WORD   177401                  ;SEL6 VALUE (OR BITS TO SET IN BSEL6)
                                                                ;****                   ****

032610                          ESCAPE  TST             ;IF ERROR, BR TO TEST END
032610  104410                                                                  TRAP    C$ESCAPE
032612  000164                                                                  .WORD   L10063-.
032614                          DMRIN   TIMER,0,10      ;SET REP/SEL TIMER
                                                        ;**** MACRO EXPANSION ****
032614  004737  012062          JSR     PC, $DMRIN      ;CALL DMR MODE INPUT ROUTINE
032620  000012                  .WORD   TIMER           ;INPUT COMMAND
032622  000000                  .WORD   0               ;SEL4 VALUE (OR BITS TO CLEAR IN BSEL6)
032624  000010                  .WORD   10              ;SEL6 VALUE (OR BITS TO SET IN BSEL6)
                                                        ;****                   ****

032626                          ESCAPE  TST             ;IF ERROR, BR TO TEST END.
032626  104410                                                                  TRAP    C$ESCAPE
032630  000146                                                                  .WORD   L10063-.
032632                          CNTRIN                  ;MACRO FOR CONTROL IN (FULL DUPLEX)
                                                        ;**** MACRO EXPANSION ****
```

```
6825  032632  004737  011522          JSR     PC, $CNTIN      ;CALL CONTRÓL IN ROUTINE WITH DEFAULT
6826  032636  000000                  .WORD   0               ;SEL6 - FULL DUPLEX, RUN MODE, 1 SEC START.
6827                                                          ;****                   ****
6828
6829  032640                          ESCAPE  TST             ;IF ERROR, BR TO TEST END.
6830  032640  104410                                                          TRAP    C$ESCAPE
6831  032642  000134                                                        .WORD   L10063-.
6832
6833                                                          ;BLIND THE RECEIVER BY GOING INTO HDX.
6834  032644                          DMRIN   WMODEM,0,BIT4   ;USE WRITE MODEM COMMAND TO SET HALF DUPLEX.
6835                                                          ;**** MACRO EXPANSION ****
6836  032644  004737  012062          JSR     PC, $DMRIN      ;CALL DMR MODE INPUT ROUTINE
6837  032650  000005                  .WORD   WMODEM          ;INPUT COMMAND
6838  032652  000000                  .WORD   0               ;SEL4 VALUE (OR BITS TO CLEAR IN BSEL6)
6839  032654  000020                  .WORD   BIT4            ;SEL6 VALUE (OR BITS TO SET IN BSEL6)
6840                                                          ;****                   ****
6841
6842  032656                          BACCIT                  ;BA/CC IN XMIT BUFFER
6843                                                          ;**** MACRO EXPANSION ****
6844  032656  004737  012272          JSR     PC, $BACC       ;CALL BA/CC IN ROUTINE WITH DEFAULTS
6845  032662  000040                  .WORD   RQI!BACCT       ;BA/CC IN TRANSMIT COMMAND
6846  032664  002522                  .WORD   TBUF            ;TRANSMIT BUFFER ADDRESS
6847  032666  000044                  .WORD   TCOUNT          ;TRANSMIT CHARACTER COUNT
6848                                                          ;****                   ****
6849
6850  032670                          ESCAPE  TST             ;IF ERROR, EXIT
6851  032670  104410                                                          TRAP    C$ESCAPE
6852  032672  000104                                                        .WORD   L10063-.
6853  032674                          WAIT    RDO             ;WAIT FOR THE READY OUT.
6854                                                          ;**** MACRO EXPANSION ****
6855  032674  004737  010276          JSR     PC, $WAIT       ;CALL WAIT ROUTINE
6856  032700  000001                  .WORD   1               ;FLAG THAT WE'RE WAITING FOR RDO
6857                                                          ;****                   ****
6858  032702                          ESCAPE  TST             ;IF ERROR, EXIT.
6859  032702  104410                                                          TRAP    C$ESCAPE
6860  032704  000072                                                        .WORD   L10063-.
6861  032706  023727  002416  011610  CMP     COUNT,#5000.    ;CHECK THE SOFTWARE TIMER COUNT.
6862                                                          ;THE TIMER VALUE WAS DETERMINED
6863                                                          ;EMPIRICALLY ON A 11/04, 11/34, 11/40, 11/70.
6864  032714  003005                  BGT     5$              ;IF OK - PROCEED
6865                                                          ;****************************************
6866  032716                          ERRDF   19,EMG19        ;
6867  032716  104455                                                          TRAP    C$ERDF
6868  032720  000023                                                        .WORD   19
6869  032722  020402                                                        .WORD   EMG19
6870  032724  000000                                                        .WORD   0
6871                                                          ;1MSEC PROGRAM TIMER - OUT OF RANGE.
6872                                                          ;IF THIS ERROR OCCURS, CHECK THE M8207
6873                                                          ;MICROPROCESSOR AS FOLLOWS:
6874                                                          ;RESET THE DMR, SCOPE E-69, PIN 4 TO VERIFY
6875                                                          ;THAT THE 1MSEC TIMER IS OUT OF RANGE.
6876                                                          ;****************************************
6877  032726  000423                  BR      25$
6878  032730                  5$:
6879  032730  032777  000001  147276  BIT     #CNTRL,@SEL2    ;IS THIS A CONTROL OUT
6880  032736  001005                  BNE     10$             ;IF YES, PROCEED.
```

```
                                        TEST 10 - TIME OUT ERROR

 6881  032740                         ERRDF   8,EMG8,ERRG2    ;EXPECTED A CONTROL OUT.
 6882  032740  104455                                                          TRAP    C$ERDF
 6883  032742  000010                                                          .WORD   8
 6884  032744  017774                                                          .WORD   EMG8
 6885  032746  015124                                                          .WORD   ERRG2
 6886  032750  000410                 BR      20$             ;EXIT
 6887  032752                 10$:
 6888  032752  032777  000002  147260 BIT     #TOUT,@SEL6     ;WAS THE TIME OUT REPORTED?
 6889  032760  001004                 BNE     20$             ;IF YES, EXIT
 6890  032762                         ERRDF   9,EMG9,ERRG2    ;UNEXPECTED ERROR.
 6891  032762  104455                                                          TRAP    C$ERDF
 6892  032764  000011                                                          .WORD   9
 6893  032766  020040                                                          .WORD   EMG9
 6894  032770  015124                                                          .WORD   ERRG2
 6895  032772                 20$:
 6896  032772                         SHUTDN
 6897                                                  ;**** MACRO EXPANSION ****
 6898  032772  004737  012562         JSR     PC, $HALT       ;DMR HALT ROUTINE.
 6899                                                  ;****                 ****
 6900  032776                 25$:
 6901
 6902  032776                 ENDTST
 6903  032776                                                          L10063:
 6904  032776  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.
                                ;*
                                ;*****************************************************************
033000                          BGNTST
033000                                                                          T11::
033000                                  CLEAR                   ;MACRO FOR MASTER CLEAR
                                                                ;**** MACRO EXPANSION ****
033000  004737  011070                  JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                                ;****                 ****

033004                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
033004  104410                                                                  TRAP    C$ESCAPE
033006  000150                                                                  .WORD   L10064-.
033010                                  BASEIN                  ;MACRO FOR BASE IN COMMAND
                                                                ;**** MACRO EXPANSION ****
033010  004737  011266                  JSR     PC, $BASEI      ;CALL BASE IN ROUTINE WITH DEFAULTS
033014  004000                          .WORD   LPLU            ;SET LINE UNIT LOOP
033016  002640                          .WORD   BASE            ;BASE TABLE ADDRESS
033020  000522                          .WORD   DMR             ;DMR-11 MODE
                                                                ;****                 ****

033022                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
033022  104410                                                                  TRAP    C$ESCAPE
033024  000132                                                                  .WORD   L10064-.
033026                                  CNTRIN                  ;MACRO FOR CONTROL IN (FULL DUPLEX)
                                                                ;**** MACRO EXPANSION ****
033026  004737  011522                  JSR     PC, $CNTIN      ;CALL CONTROL IN ROUTINE WITH DEFAULT
033032  000000                          .WORD   0               ;SEL6 - FULL DUPLEX, RUN MODE, 1 SEC START.
                                                                ;****                 ****

033034                                  ESCAPE  TST             ;IF ERROR, BR TO TEST END.
033034  104410                                                                  TRAP    C$ESCAPE
033036  000120                                                                  .WORD   L10064-.
033040                                  BACCIR  RBUF,RCOUNT/2   ;SET UP THE RECEIVE BUFFER WITH 1/2 BUF. SPACE
                                                                ;**** MACRO EXPANSION ****
033040  004737  012272                  JSR     PC, $BACC       ;CALL BA/CC IN ROUTINE
033044  000044                          .WORD   RQI!BACCR               ;BA/CC IN RECEIVE COMMAND
033046  002572                          .WORD   RBUF            ;BUFFER ADDRESS BITS 0-15
033050  000022                          .WORD   RCOUNT/2                ;BA BITS 16/17 AND CHAR. COUNT
                                                                ;****                 ****

033052  012737  000001  002366          MOV     #CNTRL,ERROR    ;THIS FLAG WILL DISABLE ANY CONTROL OUT ERROR
                                                                ;REPORTING BECAUSE WE ARE INTENTIONALLY
                                                                ;CAUSING ONE IN THIS TEST.
033060                                  BACCIT                  ;BA/CC IN XMIT COMMAND
                                                                ;**** MACRO EXPANSION ****
033060  004737  012272                  JSR     PC, $BACC       ;CALL BA/CC IN ROUTINE WITH DEFAULTS
033064  000040                          .WORD   RQI!BACCT               ;BA/CC IN TRANSMIT COMMAND
033066  002522                          .WORD   TBUF            ;TRANSMIT BUFFER ADDRESS
033070  000044                          .WORD   TCOUNT          ;TRANSMIT CHARACTER COUNT
                                                                ;****                 ****
```

```
6961  033072                          10$:
6962  033072                                WAIT    RDO             ;WAIT FOR RDO TO BE SET
6963                                                                ;**** MACRO EXPANSION ****
6964  033072  004737  010276                JSR     PC, $WAIT       ;CALL WAIT ROUTINE
6965  033076  000001                        .WORD   1               ;FLAG THAT WE'RE WAITING FOR RDO
6966                                                                ;****                 ****
6967  033100                                ESCAPE  TST             ;IF RDO NOT SET, BR TO TEST END.
6968  033100  104410                                                                 TRAP    C$ESCAPE
6969  033102  000054                                                                 .WORD   L10064-.
6970  033104  032777  000001  147122        BIT     #CNTRL,@SEL2    ;IS THIS A CONTROL OUT?
6971  033112  001005                        BNE     20$             ;IF YES, PROCEED
6972  033114                                ERRDF   8,EMG8,ERRG2    ;EXPECTED CONTROL OUT.
6973  033114  104455                                                                 TRAP    C$ERDF
6974  033116  000010                                                                 .WORD   8
6975  033120  017774                                                                 .WORD   EMG8
6976  033122  015124                                                                 .WORD   ERRG2
6977  033124  000410                        BR      40$             ;EXIT
6978  033126                          20$:
6979  033126  032777  000020   47104        BIT     #TOLONG,@SEL6   ;IS THE TOO LONG BIT SET?
6980  033134  001004                        BNE     40$             ;IF YES, TEST OK - FINISH UP.
6981  033136                          30$:
6982  033136                                ERRDF   9,EMG9,ERRG2    ;WE'RE NOT GETTING EXPECTED RESULT
6983  033136  104455                                                                 TRAP    C$ERDF
6984  033140  000011                                                                 .WORD   9
6985  033142  020040                                                                 .WORD   EMG9
6986  033144  015124                                                                 .WORD   ERRG2
6987
6988  033146                          40$:
6989  033146  005037  002366                CLR     ERROR           ;RESTORE ERROR FLAG TO NORMAL STATE.
6990  033152                                SHUTDN                  ;HALT THE DMR.
6991                                                                ;**** MACRO EXPANSION ****
6992  033152  004737  012562                JSR     PC, $HALT       ;DMR HALT ROUTINE.
6993                                                                ;****                 ****
6994
6995
6996
6997  033156                          ENDTST
6998  033156                                                                  L10064:
6999  033156  104401                                                                 TRAP    C$ETST
7000
7001
```

```
                                .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
                                ;*
                                ;*****************************************************************
033160                          BGNTST
033160                                                                  T12::
033160                            BGNSUB
033160                                                                  T12.1:
033160  104402                                                                  TRAP    C$BSUB

033162                                  CLEAR                   ;MASTER CLEAR MACRO
                                                                ;**** MACRO EXPANSION ****
033162  004737  011070                  JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                                ;****                 ****

033166                                  BASEIN
                                                                ;**** MACRO EXPANSION ****
033166  004737  011266                  JSR     PC, $BASEI      ;CALL BASE IN ROUTINE WITH DEFAULTS
033172  004000                          .WORD   LPLU            ;SET LINE UNIT LOOP
033174  002640                          .WORD   BASE            ;BASE TABLE ADDRESS
033176  000522                          .WORD   DMR             ;DMR-11 MODE
                                                                ;****                 ****

033200  012737  000001  002366  MOV     #CNTRL,ERROR            ;THIS FLAG WILL DISABLE ANY CONTROL OUT ERROR
                                                                ;REPORTING BECAUSE WE ARE INTENTIONALLY
                                                                ;CAUSING ONE IN THIS TEST.
033206                          BASEIN                          ;SECOND BASE IN
                                                                ;**** MACRO EXPANSION ****
033206  004737  011266          JSR     PC, $BASEI              ;CALL BASE IN ROUTINE WITH DEFAULTS
033212  004000                  .WORD   LPLU                    ;SET LINE UNIT LOOP
033214  002640                  .WORD   BASE                    ;BASE TABLE ADDRESS
033216  000522                  .WORD   DMR                     ;DMR-11 MODE
                                                                ;****                 ****

033220                          WAIT    RDO                     ;WAIT FOR RDO TO BE SET
                                                                ;**** MACRO EXPANSION ****
033220  004737  010276          JSR     PC, $WAIT               ;CALL WAIT ROUTINE
033224  000001                  .WORD   1                       ;FLAG THAT WE'RE WAITING FOR RDO
                                                                ;****                 ****
033226                          ESCAPE  TST                     ;IF RDO NOT SET, BR TO TEST END.
033226  104410                                                                  TRAP    C$ESCAPE
033230  000632                                                                  .WORD   L10065-.
033232  032777  000001  146774  BIT     #CNTRL,@SEL2            ;IS THIS A CONTROL OUT?
033240  001005                  BNE     10$                     ;IF YES, PROCEED.
033242                          ERRDF   8,EMG8,ERRG2            ;EXPECTED CONTROL OUT
033242  104455                                                                  TRAP    C$ERDF
```

```
7058  033244  00001C                                                          .WORD   8
7059  033246  017774                                                          .WORD   EMG8
7060  033250  015124                                                          .WORD   ERRG2
7061  033252  000410                      BR      15$             ;EXIT
7062  033254                       10$:
7063  033254  032777  001000  146756      BIT     #HALTC,@SEL6    ;IS THE HALT - PROCEDURE ERROR BIT SET?
7064  033262  001004                      BNE     15$             ;IF YES - ERROR REPORTED CORRECTLY
7065  033264                              ERRDF   9,EMG9,ERRG2    ;UNEXPECTED CONTROL OUT RECEIVED
7066  033264  104455                                                          TRAP    C$ERDF
7067  033266  000011                                                          .WORD   9
7068  033270  020040                                                          .WORD   EMG9
7069  033272  015124                                                          .WORD   ERRG2
7070  033274                       15$:
7071  033274  042777  000207  146732      BIC     #RDO!CMD,@SEL2  ;CLEAR RDO AND THE COMMAND BITS
7072  033302  005037  002366              CLR     ERROR           ;RESTORE FLAG
7073  033306                     ENDSUB
7074  033306                                                                  L10066:
7075  033306  104403                                                          TRAP    C$ESUB
7076
7077  033310                     BGNSUB
7078  033310                                                                  T12.2:
7079  033310  104402                                                          TRAP    C$BSUB
7080
7081  033312                      CLEAR                           ;MASTER CLEAR MACRO
7082                                                              ;**** MACRO EXPANSION ****
7083  033312  004737  011070              JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
7084                                                              ;****                 ****
7085
7086  033316  012737  000001  002366      MOV     #CNTRL,ERROR    ;THIS FLAG WILL DISABLE ANY CONTROL OUT ERROR
7087                                                              ;REPORTING BECAUSE WE ARE INTENTIONALLY
7088                                                              ;CAUSING ONE IN THIS TEST.
7089  033324  005037  002260              CLR     DMRFLG          ;CLEAR FLAG THAT IS SET IN BASEIN IN ORDER
7090                                                              ;TO FLAG THAT A CONTROL OUT-DMR RUN MODE
7091                                                              ;COMMAND IS EXPECTED (THIS FLAG WAS SET IN
7092                                                              ;THE PREVIOUS SUBTEST BASEIN)
7093  033330                      CNTRIN                          ;CONTROL IN
7094                                                              ;**** MACRO EXPANSION ****
7095  033330  004737  011522              JSR     PC, $CNTIN      ;CALL CONTROL IN ROUTINE WITH DEFAULT
7096  033334  000000                      .WORD   0               ;SEL6 - FULL DUPLEX, RUN MODE, 1 SEC START.
7097                                                              ;****                 ****
7098
7099  033336                      WAIT    RDO                     ;WAIT FOR RDO TO BE SET
7100                                                              ;**** MACRO EXPANSION ****
7101  033336  004737  010276              JSR     PC, $WAIT       ;CALL WAIT ROUTINE
7102  033342  000001                      .WORD   1               ;FLAG THAT WE'RE WAITING FOR RDO
7103                                                              ;****                 ****
7104  033344                      ESCAPE  TST                     ;IF RDO NOT SET, BR TO TEST END.
7105  033344  104410                                                          TRAP    C$ESCAPE
7106  033346  000514                                                          .WORD   L10065-.
7107  033350  032777  000001  146656      BIT     #CNTRL,@SEL2    ;IS THIS A CONTROL OUT?
7108  033356  001005                      BNE     10$             ;IF YES - PROCEED.
7109  033360                              ERRDF   8,EMG8,ERRG2    ;EXPECTED CONTROL OUT
7110  033360  104455                                                          TRAP    C$ERDF
7111  033362  000010                                                          .WORD   8
7112  033364  017774                                                          .WORD   EMG8
7113  033366  015124                                                          .WORD   ERRG2
```

```
7114  033370  000410                          BR      15$             ;EXIT
7115  033372                          10$:
7116  033372  032777  001000  146640          BIT     #HALTC,@SEL6    ;IS THE HALT - PROCEDURE ERROR BIT SET?
7117  033400  001004                          BNE     15$             ;IF YES - ERROR REPORTED CORRECTLY
7118  033402                                  ERRDF   9,EMG9,ERRG2    ;UNEXPECTED CONTROL OUT RECEIVED
7119  033402  104455                                                          TRAP    C$ERDF
7120  033404  000011                                                          .WORD   9
7121  033406  020040                                                          .WORD   EMG9
7122  033410  015124                                                          .WORD   ERRG2
7123  033412                          15$:
7124  033412  042777  000207  146614          BIC     #RDO.CMD,@SEL2  ;CLEAR RDO AND THE COMMAND BITS.
7125  033420  005037  002366                  CLR     ERROR           ;RESTORE FLAG
7126  033424                            ENDSUB
7127  033424                                                                  L10067:
7128  033424  104403                                                          TRAP    C$ESUB
7129
7130  033426                            BGNSUB
7131  033426                                                                  T12.3:
7132  033426  104402                                                          TRAP    C$BSUB
7133
7134  033430                                  CLEAR                   ;MASTER CLEAR MACRO
7135                                                                  ;**** MACRO EXPANSION ****
7136  033430  004737  011070                  JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
7137                                                                  ;****                   ****
7138
7139  033434  012737  000001  002366          MOV     #CNTRL,ERROR    ;THIS FLAG WILL DISABLE ANY CONTROL OUT ERROR
7140                                                                  ;REPORTING BECAUSE WE ARE INTENTIONALLY
7141                                                                  ;CAUSING ONE IN THIS TEST.
7142  033442                          BACCIR                          ;BA/CC IN RCV. COMMAND
7143                                                                  ;**** MACRO EXPANSION ****
7144  033442  004737  012272                  JSR     PC, $BACC       ;CALL BA/CC IN ROUTINE WITH DEFAULTS
7145  033446  000044                          .WORD   RQI!BACCR       ;BA/CC IN RECEIVE COMMAND
7146  033450  002572                          .WORD   RBUF    ;RECEIVE BUFFER
7147  033452  000044                          .WORD   RCOUNT  ;RECEIVE CHARACTER COUNT
7148                                                                  ;****                   ****
7149
7150  033454                          WAIT    RDO                     ;WAIT FOR RDO TO BE SET
7151                                                                  ;**** MACRO EXPANSION ****
7152  033454  004737  010276                  JSR     PC, $WAIT       ;CALL WAIT ROUTINE
7153  033460  000001                          .WORD   1               ;FLAG THAT WE'RE WAITING FOR RDO
7154                                                                  ;****                   ****
7155  033462                          ESCAPE  TST                     ;IF RDO NOT SET, BR TO TEST END.
7156  033462  104410                                                          TRAP    C$ESCAPE
7157  033464  000376                                                          .WORD   L10065-.
7158  033466  032777  000001  146540          BIT     #CNTRL,@SEL2    ;IS THIS A CONTROL OUT?
7159  033474  001005                          BNE     10$             ;IF YES - PROCEED.
7160  033476                                  ERRDF   8,EMG8,ERRG2    ;EXPECTED CONTROL OUT
7161  033476  104455                                                          TRAP    C$ERDF
7162  033500  000010                                                          .WORD   8
7163  033502  017774                                                          .WORD   EMG8
7164  033504  015124                                                          .WORD   ERRG2
7165  033506  000410                          BR      15$             ;EXIT
7166  033510                          10$:
7167  033510  032777  001000  146522          BIT     #HALTC,@SEL6    ;IS THE HALT - PROCEDURE ERROR BIT SET?
7168  033516  001004                          BNE     15$             ;IF YES - ERROR REPORTED CORRECTLY
7169  033520                                  ERRDF   9,EMG9,ERRG2    ;UNEXPECTED CONTROL OUT RECEIVED
```

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7170  033520  104455                                                          TRAP    C$ERDF
7171  033522  000011                                                          .WORD   9
7172  033524  020040                                                          .WORD   EMG9
7173  033526  015124                                                          .WORD   ERRG2
7174  033530                          15$:
7175  033530  042777  000207  146476          BIC     #RDO!CMD,@SEL2  ;CLEAR RDO AND THE COMMAND BITS.
7176  033536  005037  002366                  CLR     ERROR           ;RESTORE FLAG
7177  033542                        ENDSUB
7178  033542                                                                L10070:
7179  033542  104403                                                          TRAP    C$ESUB
7180
7181  033544                        BGNSUB
7182  033544                                                                T12.4:
7183  033544  104402                                                          TRAP    C$BSUB
7184  033546                              CLEAR                   ;MASTER CLEAR
7185                                                              ;**** MACRO EXPANSION ****
7186  033546  004737  011070              JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
7187                                                              ;****                 ****
7188
7189  033552                              ESCAPE  TST             ;IF ERROR, EXIT.
7190  033552  104410                                                          TRAP    C$ESCAPE
7191  033554  000306                                                          .WORD   L10065-.
7192  033556                              BASEIN                  ;BASE IN COMMAND
7193                                                              ;**** MACRO EXPANSION ****
7194  033556  004737  011266              JSR     PC, $BASEI      ;CALL BASE IN ROUTINE WITH DEFAULTS
7195  033562  004000                              .WORD   LPLU    ;SET LINE UNIT LOOP
7196  033564  002640                              .WORD   BASE    ;BASE TABLE ADDRESS
7197  033566  000522                              .WORD   DMR     ;DMR-11 MODE
7198                                                              ;****                 ****
7199
7200  033570                              ESCAPE  TST             ;IF ERROR, EXIT.
7201  033570  104410                                                          TRAP    C$ESCAPE
7202  033572  000270                                                          .WORD   L10065-.
7203  033574                              BACCIR                  ;ASSIGN A BA/CC IN RECEIVE BUFFER
7204                                                              ;**** MACRO EXPANSION ****
7205  033574  004737  012272              JSR     PC, $BACC       ;CALL BA/CC IN ROUTINE WITH DEFAULTS
7206  033600  000044                              .WORD   RQI!BACCR       ;BA/CC IN RECEIVE COMMAND
7207  033602  002572                              .WORD   RBUF    ;RECEIVE BUFFER
7208  033604  000044                              .WORD   RCOUNT  ;RECEIVE CHARACTER COUNT
7209                                                              ;****                 ****
7210
7211  033606                              ESCAPE  TST             ;IF ERROR, EXIT.
7212  033606  104410                                                          TRAP    C$ESCAPE
7213  033610  000252                                                          .WORD   L10065-.
7214  033612  012737  000001  002366      MOV     #CNTRL,ERROR    ;THIS FLAG WILL DISABLE ANY CONTROL OUT
7215                                                              ;ERROR REPORTING BECAUSE WE ARE INTENTIONALLY
7216                                                              ;CAUSING ONE.
7217  033620                              BACCIT  TBUF,0          ;ASSIGN A BA/CC IN XMIT BUFFER LENGTH = 0.
7218                                                              ;**** MACRO EXPANSION ****
7219  033620  004737  012272              JSR     PC, $BACC       ;CALL BA/CC IN ROUTINE
7220  033624  000040                              .WORD   RQI!BACCT       ;BA/CC IN TRANSMIT COMMAND
7221  033626  002522                              .WORD   TBUF    ;BUFFER ADDRESS BITS 0-15
7222  033630  000000                              .WORD   0       ;BA BITS 16 & 17 AND CHAR. COUNT
7223                                                              ;****                 ****
7224
7225  033632                              WAIT    RDO             ;WAIT FOR RDO TO BE SET
```

```
7226
7227  033632  004737  010276          JSR     PC, $WAIT       ;**** MACRO EXPANSION ****
7228  033636  000001                  .WORD   1               ;CALL WAIT ROUTINE
7229                                                          ;FLAG THAT WE'RE WAITING FOR RDO
7230  033640                          ESCAPE  TST             ;****                    ****
7231  033640  104410                                                          ;IF RDO NOT SET, BR TO TEST END.
7232  033642  000220                                                                  TRAP    C$ESCAPE
7233  033644  032777  000001  146362          BIT     #CNTRL,@SEL2    ;IS THIS A CONTROL OUT?
7234  033652  001005                  BNE     10$             ;IF YES - PROCEED.
7235  033654                          ERRDF   8,EMG8,ERRG2    ;EXPECTED CONTROL OUT
7236  033654  104455                                                                  TRAP    C$ERDF
7237  033656  000010                                                                  .WORD   8
7238  033660  017774                                                                  .WORD   EMG8
7239  033662  015124                                                                  .WORD   ERRG2
7240  033664  000410                  BR      15$             ;EXIT
7241  033666                  10$:
7242  033666  032777  001000  146344          BIT     #HALTC,@SEL6    ;IS THE HALT - PROCEDURE ERROR BIT SET?
7243  033674  001004                  BNE     15$             ;IF YES - ERROR REPORTED CORRECTLY
7244  033676                          ERRDF   9,EMG9,ERRG2    ;UNEXPECTED CONTROL OUT RECEIVED
7245  033676  104455                                                                  TRAP    C$ERDF
7246  033700  000011                                                                  .WORD   9
7247  033702  020040                                                                  .WORD   EMG9
7248  033704  015124                                                                  .WORD   ERRG2
7249  033706                  15$:
7250  033706  042777  000207  146320          BIC     #RDO!CMD,@SEL2  ;CLEAR RDO AND THE COMMAND BITS.
7251  033714  005037  002366                  CLR     ERROR           ;RESTORE FLAG
7252  033720                  ENDSUB
7253  033720                                                                  L10071:
7254  033720  104403                                                                  TRAP    C$ESUB
7255
7256  033722                  BGNSUB
7257  033722                                                                  T12.5:
7258  033722  104402                                                                  TRAP    C$BSUB
7259  033724                          CLEAR                   ;MASTER CLEAR
7260                                                          ;**** MACRO EXPANSION ****
7261  033724  004737  011070          JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
7262                                                          ;****                    ****
7263
7264  033730                          ESCAPE  TST             ;IF ERROR, EXIT.
7265  033730  104410                                                                  TRAP    C$ESCAPE
7266  033732  000130                                                                  .WORD   L10065-.
7267  033734                          BASEIN                  ;BASE IN COMMAND
7268                                                          ;**** MACRO EXPANSION ****
7269  033734  004737  011266          JSR     PC, $BASEI      ;CALL BASE IN ROUTINE WITH DEFAULTS
7270  033740  004000                  .WORD   LPLU            ;SET LINE UNIT LOOP
7271  033742  002640                  .WORD   BASE            ;BASE TABLE ADDRESS
7272  033744  000522                  .WORD   DMR             ;DMR-11 MODE
7273                                                          ;****                    ****
7274
7275  033746                          ESCAPE  TST             ;IF ERROR, EXIT.
7276  033746  104410                                                                  TRAP    C$ESCAPE
7277  033750  000112                                                                  .WORD   L10065-.
7278  033752  012737  000001  002366          MOV     #CNTRL,ERROR    ;THIS FLAG WILL DISABLE ANY CONTROL OUT
7279                                                          ;ERROR REPORTING BECAUSE WE ARE INTENTIONALLY
7280                                                          ;CAUSING ONE.
7281  033760                          BACCIR  RBUF,0          ;ASSIGN A BA/CC IN REC. BUFFER LENGTH = 0
```

```
7282
7283  033760  004737  012272                  JSR     PC, $BACC       ;**** MACRO EXPANSION ****
7284  033764  000044                          .WORD   RQI!BACCR       ;CALL BA/CC IN ROUTINE
7285  033766  002572                          .WORD   RBUF            ;BA/CC IN RECEIVE COMMAND
7286  033770  000000                          .WORD   0               ;BUFFER ADDRESS BITS 0-15
7287                                                                  ;BA BITS 16/17 AND CHAR. COUNT
7288                                                                  ;****                  ****
7289  033772                                  WAIT    RDO             ;WAIT FOR RDO TO BE SET
7290                                                                  ;**** MACRO EXPANSION ****
7291  033772  004737  010276                  JSR     PC, $WAIT       ;CALL WAIT ROUTINE
7292  033776  000001                          .WORD   1               ;FLAG THAT WE'RE WAITING FOR RDO
7293                                                                  ;****                  ****
7294  034000                                  ESCAPE  TST             ;IF RDO NOT SET, BR TO TEST END.
7295  034000  104410                                                                  TRAP    C$ESCAPE
7296  034002  000060                                                                  .WORD   L10065-.
7297  034004  032777  000001  146222          BIT     #CNTRL,@SEL2    ;IS THIS A CONTROL OUT?
7298  034012  001005                          BNE     10$             ;IF YES - PROCEED.
7299  034014                                  ERRDF   8,EMG8,ERRG2    ;EXPECTED CONTROL OUT
7300  034014  104455                                                                  TRAP    C$ERDF
7301  034016  000010                                                                  .WORD   8
7302  034020  017774                                                                  .WORD   EMG8
7303  034022  015124                                                                  .WORD   ERRG2
7304  034024  000410                          BR      15$             ;EXIT
7305  034026                          10$:
7306  034026  032777  001000  146204          BIT     #HALTC,@SEL6    ;IS THE HALT - PROCEDURE ERROR BIT SET?
7307  034034  001004                          BNE     15$             ;IF YES - ERROR REPORTED CORRECTLY
7308  034036                                  ERRDF   9,EMG9,ERRG2    ;UNEXPECTED CONTROL OUT RECEIVED
7309  034036  104455                                                                  TRAP    C$ERDF
7310  034040  000011                                                                  .WORD   9
7311  034042  020040                                                                  .WORD   EMG9
7312  034044  015124                                                                  .WORD   ERRG2
7313  034046                          15$:
7314  034046  042777  000207  146160          BIC     #RDO!CMD,@SEL2  ;CLEAR RDO AND THE COMMAND BITS.
7315  034054  005037  002366                  CLR     ERROR           ;RESTORE FLAG
7316  034060                            ENDSUB
7317  034060                                                                  L10072:
7318  034060  104403                                                                  TRAP    C$ESUB
7319
7320  034062                          ENDTST
7321  034062                                                                  L10065:
7322  034062  104401                                                                  TRAP    C$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.
                                ;*************************************************************************
034064                          BGNTST
034064                                                                          T13::
034064  013700  000044                MOV     RCOUNT,R0       ;BYTE COUNT FOR RECEIVE BUFFER
034070  062700  000002                ADD     #2,R0           ;2 ADDITIONAL BYTES AT END OF BUFFER ARE
                                                                ;USED FOR DELIMITOR
034074  012701  002572                MOV     #RBUF,R1        ;ADDRESS OF RECEIVE BUFFER
034100                          10$:
034100  105021                        CLRB    (R1)+           ;CLEAR A BYTE IN THE BUFFER
034102  005300                        DEC     R0              ;CONTINUE - UNTIL ENTIRE BUFFER DONE
034104  001375                        BNE     10$
034106  005037  002520                CLR     TFLAG           ;CLEAR TRANSMIT FLAG
034112  005037  002570                CLR     RFLAG           ;CLEAR RECEIVER FLAG
034116                                CLEAR                   ;MACRO FOR MASTER CLEAR
                                                                ;**** MACRO EXPANSION ****
034116  004737  011070                JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                                ;****                 ****
034122                                ESCAPE  TST             ;IF ERROR, BR TO TEST END.
034122  104410                                                                  TRAP    C$ESCAPE
034124  000466                                                                  .WORD   L10073-.
034126  005737  002254                TST     DMTURN          ;IS INTERNAL LOOPBACK DESIRED?
034132  001004                        BNE     11$             ;IF NOT, CLEAR INTERNAL LOOPBACK.
034134  052737  004000  034156        BIS     #LPLU,100$      ;SET LINE UNIT LOOPBACK.
034142  000403                        BR      12$
034144                          11$:
034144  042737  004000  034156        BIC     #LPLU,100$      ;CLEAR LINE UNIT LOOPBACK.
034152                          12$:
034152                                CALL    $BASEI          ;BASE IN COMMAND.
034156  000000                100$:           .WORD   0       ;MAINTENANCE BITS (LINE UNIT LOOP)
034160  002640                                .WORD   BASE    ;BASE TABLE ADDRESS
034162  000522                                .WORD   DMR     ;DMR MODE
034164                                ESCAPE  TST             ;IF ERROR, BR TO TEST END.
034164  104410                                                                  TRAP    C$ESCAPE
034166  000424                                                                  .WORD   L10073-.
034170                                CALL    $LOOP           ;DMR COMMAND TO SET MAINT. BITS
034174                                ESCAPE  TST             ;IF ERROR, BR TO TEST END.
034174  104410                                                                  TRAP    C$ESCAPE
034176  000414                                                                  .WORD   L10073-.
034200                                CNTRIN                  ;MACRO FOR CONTROL IN (FULL DUPLEX)
                                                                ;**** MACRO EXPANSION ****
034200  004737  011522                JSR     PC, $CNTIN      ;CALL CONTROL IN ROUTINE WITH DEFAULT
034204  000000                        .WORD   0               ;SEL6 - FULL DUPLEX, RUN MODE, 1 SEC START.
                                                                ;****                 ****
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 7379  034206                                 ESCAPE  TST             ;IF ERROR, BR TO TEST END.
 7380  034206  104410                                                                 TRAP    C$ESCAPE
 7381  034210  000402                                                                 .WORD   L10073-.
 7382
 7383  034212                                 BACCIR                  ;BUFFER ADDRESS/CHARACTER COUNT REC. IN
 7384                                                                 ;**** MACRO EXPANSION ****
 7385  034212  004737  012272                 JSR     PC, $BACC       ;CALL BA/CC IN ROUTINE WITH DEFAULTS
 7386  034216  000044                         .WORD   RQI!BACCR       ;BA/CC IN RECEIVE COMMAND
 7387  034220  002572                         .WORD   RBUF    ;RECEIVE BUFFER
 7388  034222  000044                         .WORD   RCOUNT  ;RECEIVE CHARACTER COUNT
 7389                                                                 ;****                   ****
 7390
 7391  034224                                 ESCAPE  TST             ;IF ERROR (I.E. RDI NOT SET), ESCAPE
 7392  034224  104410                                                                 TRAP    C$ESCAPE
 7393  034226  000364                                                                 .WORD   L10073-.
 7394
 7395  034230                                 BACCIT                  ;BUFFER ADDRESS/CHARACTER COUNT XMIT. IN
 7396                                                                 ;**** MACRO EXPANSION ****
 7397  034230  004737  012272                 JSR     PC, $BACC       ;CALL BA/CC IN ROUTINE WITH DEFAULTS
 7398  034234  000040                         .WORD   RQI!BACCT       ;BA/CC IN TRANSMIT COMMAND
 7399  034236  002522                         .WORD   TBUF    ;TRANSMIT BUFFER ADDRESS
 7400  034240  000044                         .WORD   TCOUNT  ;TRANSMIT CHARACTER COUNT
 7401                                                                 ;****                   ****
 7402
 7403  034242                                 ESCAPE  TST             ;IF ERROR (I.E. RDI NOT SET), ESCAPE
 7404  034242  104410                                                                 TRAP    C$ESCAPE
 7405  034244  000346                                                                 .WORD   L10073-.
 7406
 7407  034246                         20$:
 7408  034246                                 WAIT    RDO             ;WAIT FOR RDO
 7409                                                                 ;**** MACRO EXPANSION ****
 7410  034246  004737  010276                 JSR     PC, $WAIT       ;CALL WAIT ROUTINE
 7411  034252  000001                         .WORD   1               ;FLAG THAT WE'RE WAITING FOR RDO
 7412                                                                 ;****                   ****
 7413  034254                                 BFRROR  52$             ;IF ERROR - RDO NOT SET, END TEST
 7414  034254  103552                                                                 BCS     52$
 7415  034256  032777  000001  145750         BIT     #CNTRL,@SEL2    ;IS THIS A CONTROL OUT COMMAND ?
 7416  034264  001405                         BEQ     25$             ;IF NOT - PROCEED
 7417  034266                                 ERRDF   9,EMG9,ERRG2    ;UNEXPECTED CONTROL OUT RECEIVED
 7418  034266  104455                                                                 TRAP    C$ERDF
 7419  034270  000011                                                                 .WORD   9
 7420  034272  020040                                                                 .WORD   EMG9
 7421  034274  015124                                                                 .WORD   ERRG2
 7422  034276  000541                         BR      52$
 7423  034300                         25$:
 7424  034300  032777  000004  145726         BIT     #RCV,@SEL2      ;TRANSMIT OR RECEIVE ?
 7425  034306  001035                         BNE     40$             ;BR FOR RECEIVE
 7426
 7427                                 ;CHECK TRANSMIT
 7428
 7429  034310  005737  002520                 TST     TFLAG           ;IS THIS THE FIRST TRANSMIT DONE?
 7430  034314  001405                         BEQ     30$             ;YES - OK
 7431  034316                                 ERRDF   10,EMG10,ERRG2  ;ERROR MULTIPLE TRANSMITS
 7432  034316  104455                                                                 TRAP    C$ERDF
 7433  034320  000012                                                                 .WORD   10
 7434  034322  020067                                                                 .WORD   EMG10
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7435  034324  015124                                                                  .WORD   ERRG2
7436  034326  000525                    BR      52$
7437  034330                    30$:
7438  034330  012737  177777  002520    MOV     #-1,TFLAG       ;FLAG THAT TRANSMIT CHECK IS DONE.
7439  034336  022777  002522  145672    CMP     #TBUF,@SEL4     ;TRANSMIT BUFFER ADDRESS CORRECT?
7440  034344  001405                    BEQ     32$             ;YES - PROCEED
7441  034346                            ERRDF   11,EMG11,ERRG2  ;BUFFER ADDRESS ERROR
7442  034346  104455                                                                  TRAP    C$ERDF
7443  034350  000013                                                                  .WORD   11
7444  034352  020116                                                                  .WORD   EMG11
7445  034354  015124                                                                  .WORD   ERRG2
7446  034356  000511                    BR      52$
7447  034360                    32$:
7448  034360  022777  000044  145652    CMP     #TCOUNT,@SEL6   ;COUNT CORRECT ?
7449  034366  001470                    BEQ     50$             ;YES - PROCEED
7450  034370                            ERRDF   12,EMG12,ERRG2  ;CHARACTER COUNT ERROR
7451  034370  104455                                                                  TRAP    C$ERDF
7452  034372  000014                                                                  .WORD   12
7453  034374  020141                                                                  .WORD   EMG12
7454  034376  015124                                                                  .WORD   ERRG2
7455  034400  000500                    BR      52$
7456
7457                            ;CHECK RECEIVE
7458
7459  034402                    40$:
7460  034402  005737  002570            TST     RFLAG           ;IS THIS THE FIRST RECEIVE DONE ?
7461  034406  001405                    BEQ     41$             ;YES - PROCEED
7462  034410                            ERRDF   13,EMG13,ERRG2  ;MULTIPLE RECEIVES
7463  034410  104455                                                                  TRAP    C$ERDF
7464  034412  000015                                                                  .WORD   13
7465  034414  020167                                                                  .WORD   EMG13
7466  034416  015124                                                                  .WORD   ERRG2
7467  034420  000470                    BR      52$
7468  034422                    41$:
7469  034422  012737  177777  002570    MOV     #-1,RFLAG       ;FLAG THAT RECEIVE CHECK HAS BEEN DONE.
7470  034430  022777  002572  145600    CMP     #RBUF,@SEL4     ;IS THE RECEIVE BUFFER ADDRESS CORRECT?
7471  034436  001405                    BEQ     43$             ;YES - PROCEED
7472  034440                            ERRDF   11,EMG11,ERRG2  ;BUFFER ADDRESS ERROR
7473  034440  104455                                                                  TRAP    C$ERDF
7474  034442  000013                                                                  .WORD   11
7475  034444  020116                                                                  .WORD   EMG11
7476  034446  015124                                                                  .WORD   ERRG2
7477  034450  000454                    BR      52$
7478  034452                    43$:
7479  034452  022777  000044  145560    CMP     #RCOUNT,@SEL6   ;IS THE BUFFER COUNT CORRECT?
7480  034460  001405                    BEQ     44$             ;YES - PROCEED
7481  034462                            ERRDF   12,EMG12,ERRG2  ;CHARACTER COUNT ERROR
7482  034462  104455                                                                  TRAP    C$ERDF
7483  034464  000014                                                                  .WORD   12
7484  034466  020141                                                                  .WORD   EMG12
7485  034470  015124                                                                  .WORD   ERRG2
7486  034472  000443                    BR      52$
7487  034474                    44$:
7488  034474  012700  000044            MOV     #RCOUNT,R0      ;SET UP FOR DATA CHECK (CHARCATER COUNT)
7489  034500  012701  002522            MOV     #TBUF,R1        ;GOOD DATA POINTER
7490  034504  012702  002572            MOV     #RBUF,R2        ;RECEIVE DATA POINTER
```

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7491  034510                          45$:
7492  034510  122122                        CMPB    (R1)+,(R2)+     ;IS THE DATA THE SAME ?
7493  034512  001011                        BNE     46$             ;IF NOT, BRANCH TO DATA ERROR MESSAGE
7494  034514  005300                        DEC     R0              ;CONTINUE CHECKING UNTIL DONE WITH BUFFER.
7495  034516  001374                        BNE     45$
7496  034520  005712                        TST     @R2             ;THIS SHOULD BE 0 - REMEMBER WE CLEARED
7497                                                                ;2 EXTRA BYTES DURING BUFFER INIT.
7498  034522  001412                        BEQ     50$             ;IF OK - PROCEED
7499  034524                                ERRDF   14,EMG14,ERRG2  ;RECEIVED EXTRA DATA
7500  034524  104455                                                                    TRAP    C$ERDF
7501  034526  000016                                                                    .WORD   14
7502  034530  020215                                                                    .WORD   EMG14
7503  034532  015124                                                                    .WORD   ERRG2
7504  034534  000422                        BR      52$
7505  034536                          46$:
7506  034536                                ERRDF   15,EMG15,ERRG2  ;DATA ERROR
7507  034536  104455                                                                    TRAP    C$ERDF
7508  034540  000017                                                                    .WORD   15
7509  034542  020235                                                                    .WORD   EMG15
7510  034544  015124                                                                    .WORD   ERRG2
7511  034546  000415                        BR      52$
7512
7513                                  ; TRANSMIT OR RECEIVE CHECK DONE
7514
7515  034550                          50$:
7516  034550  042777  000213  145456        BIC     #RDO+RCV+CMD,@SEL2 ;CLEAR RDO, RCV & COMMMAND BITS (0,1)
7517  034556  005737  002570                TST     RFLAG           ;IS THE RECEIVE DONE ? (IF DONE, FLAG = -1)
7518  034562  001002                        BNE     51$             ;YES - SEE IF TRANSMIT DONE
7519  034564  000137  034246                JMP     20$             ;NO - GO BACK AND DO IT.
7520  034570                          51$:
7521  034570  005737  002520                TST     TFLAG           ;IS THE TRANSMIT DONE ?
7522  034574  001002                        BNE     52$             ;YES - BR TO SHUTDOWN
7523  034576  000137  034246                JMP     20$             ;NO - DO IT
7524  034602                          52$:
7525  034602                                SHUTDN                  ;SHUTDOWN DMR
7526                                                                ;**** MACRO EXPANSION ****
7527  034602  004737  012562                JSR     PC, $HALT       ;DMR HALT ROUTINE.
7528                                                                ;****                ****
7529
7530  034606                                CALL    $ERROR          ;CHECK BASE TABLE AND REPORT ANY SOFT ERRORS
7531
7532  034612                          ENDTST
7533  034612                                                                  L10073:
7534  034612  104401                                                                  TRAP    C$ETST
7535
7536
7537
```

```
                                .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.
                                ;*
                                ;*******************************************************************************
034614                          BGNTST
034614                                                                  T14::
                                        .ENABL  LSB             ;ENABLE LOCAL BLOCK - NEEDED BECAUSE OF
                                                                ;USE  OF SYMBOLIC LABELS 'RSEL4'' ETC.
034614                                  SETVEC  #4,#NOXMEM,#PRI07 ;SET UP TRAP VECTOR 4
034614  012746  000340                                                  MOV     #PRI07,-(SP)
034620  012746  023630                                                  MOV     #NOXMEM,-(SP)
034624  012746  000004                                                  MOV     #4,-(SP)
034630  012746  000003                                                  MOV     #3,-(SP)
034634  104437                                                          TRAP    C$SVEC
034636  062706  000010                                                  ADD     #10,SP
034642  005037  002352                  CLR     NXMFLG          ;CLEAR FLAG - SET IF TRAP TO 4.
034646  005737  177572                  TST     @#177572        ;ADDRESS MEMORY MANAGEMENT REGISTER.
034652                                  CLRVEC  #4              ;RESTORE TRAP VECTOR 4.
034652  012700  000004                                                  MOV     #4,R0
034656  104436                                                          TRAP    C$CVEC
034660  005737  002352                  TST     NXMFLG          ;IS THE FLAG STILL CLEARED?
                                                                ;NOTE: THE FLAG WILL BE SET BY TRAP 4
                                                                ;IF THERE IS NO MEMORY MANAGEMENT.
034664  001404                          BEQ     10$             ;IF FLAG IS CLEARED, PROCEED WITH TEST.
034666  005037  002352                  CLR     NXMFLG          ;RESTORE FLAG
034672  000137  036236                  JMP     85$             ;EXIT - CAN'T TEST WITHOUT MEM. MANAG.
034676                          10$:
                                                                ;NOTE: L$HIMEM IS SIZE OF TOTAL MEMORY IN
                                                                ;PAGE ADDRESS REGISTER FORM - DETERMINED BY
                                                                ;BY DIAGNOSTIC SUPERVISOR AT STARTUP.
034676  023727  002120  002200        CMP     L$HIMEM,#2200   ;DO WE HAVE ENOUGH MEMORY TO ADDRESS BIT 16?
034704  002002                          BGE     15$             ;IF YES - PROCEED WITH TEST
034706  000137  036236                  JMP     85$             ;IF NOT - EXIT
034712                          15$:
034712                                  SETPRI  #PRI07          ;MAKE SURE WE ARE IN KERNEL MODE.
034712  012700  000340                                                  MOV     #PRI07,R0
034716  104441                                                          TRAP    C$SPRI
                                                                ;SETTING PRI SHOULD ALSO CLEAR BITS 14 &15
                                                                ;IN PSW WHICH PLACES PROCESSOR IN KERNEL MODE.
034720  012701  172300                  MOV     #172300,R1      ;GET ADDRESS OF KERNEL PDR  REG 0
034724  012700  000010                  MOV     #8.,R0          ;GOING TO WRITE PDR REG 0-7
034730                          20$:
034730  012721  077406                  MOV     #77406,(R1)+    ;WRITE BITS FOR THE FOLLOWING PAGE DESCRIPTION
                                                                ;READ/WRITE ACCESS, 128. BLOCK PAGE LENGTH.
034734  005300                          DEC     R0              ;WRITE ALL PDRS
034736  001374                          BNE     20$
034740  012701  172340                  MOV     #172340,R1      ;GET ADDRESS OF KERNAL PAR 0
034744  005011                          CLR     (R1)            ;PAR 0, ADDRS      0  -  17776
034746  012761  000200  000002          MOV     #200,2(R1)      ;PAR 1, ADDRS  20000  -  37776
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 7594  034754  012761  000400  000004          MOV     #400,4(R1)      ;PAR 2, ADDRS  40000  -  57776
 7595  034762  012761  000600  000006          MOV     #600,6(R1)      ;PAR 3, ADDRS  60000  -  77776
 7596  034770  012761  001000  000010          MOV     #1000,10(R1)    ;PAR 4, ADDRS 100000  - 117776
 7597  034776  012761  002000  000012          MOV     #2000,12(R1)    ;PAR 5, ADDRS 200000  - 217776
 7598  035004  012761  004000  000014          MOV     #4000,14(R1)    ;PAR 6, ADDRS 400000  - 417776
 7599  035012  012761  007600  000016          MOV     #7600,16(R1)    ;PAR 7, ADDRS 160000  - 177776 (I/O PAGE)
 7600
 7601  035020  012703  000100                  MOV     #64.,R3         ;COUNTER FOR OUTER LOOP OF TEST PATTERN GEN.
 7602  035024  012704  120000                  MOV     #120000,R4      ;USE VIRTUAL ADDRESS TO MAP TO PAR 5
 7603                                                                  ;GENERATE A TEST PATTERN IN THE 1ST 4K
 7604                                                                  ;BYTES OF PAR 5 (VIRTUAL ADDR 120000 - 127776)
 7605  035030  005037  002352                  CLR     NXMFLG          ;ENSURE FLAG IS CLEARED
 7606  035034                                  SETVEC  #4,#NOXMEM,#PRI07 ;SET UP TRAP VECTOR 4 (WILL SET FLAG)
 7607  035034  012746  000340                                                  MOV     #PRI07,-(SP)
 7608  035040  012746  023630                                                  MOV     #NOXMEM,-(SP)
 7609  035044  012746  000004                                                  MOV     #4,-(SP)
 7610  035050  012746  000003                                                  MOV     #3,-(SP)
 7611  035054  104437                                                          TRAP    C$SVEC
 7612  035056  062706  000010                                                  ADD     #10,SP
 7613  035062  012737  000001  177572          MOV     #1,@#177572     ;ENABLE MEMORY MANAGEMENT
 7614  035070                          21$:
 7615  035070  012701  000040                  MOV     #32.,R1         ;COUNTER FOR INNER LOOP OF TEST PATTERN GEN.
 7616  035074  012702  002420                  MOV     #$CCITT,R2      ;ADDRESS FOR 32. WORD TEST PATTERN
 7617  035100                          22$:
 7618  035100  012224                          MOV     (R2)+,(R4)+     ;WRITE TEST PATTERN INTO 4K BYTES
 7619                                                                  ;(PHYSICAL ADDRESS 200000 - 207776)
 7620  035102  005737  002352                  TST     NXMFLG          ;NXM TRAP 4?
 7621  035106  001014                          BNE     24$             ;IF YES - EXIT
 7622  035110  005301                          DEC     R1              ;DO THE INNER LOOP 32. TIMES
 7623  035112  001372                          BNE     22$
 7624  035114  005303                          DEC     R3              ;DO THE OUTER LOOP 128. TIMES
 7625  035116  001364                          BNE     21$
 7626  035120  012701  004000                  MOV     #4000,R1        ;COUNTER TO CLEAR THE NEXT 4K BYTES.
 7627  035124                          23$:
 7628  035124  005024                          CLR     (R4)+           ;CLEAR OUT THE ENTIRE PAR
 7629                                                                  ;(PHYSICAL ADDRESS 210000 - 217776)
 7630  035126  005737  002352                  TST     NXMFLG          ;NXM TRAP 4?
 7631  035132  001002                          BNE     24$             ;IF YES - EXIT
 7632  035134  005301                          DEC     R1
 7633  035136  001372                          BNE     23$
 7634  035140                          24$:
 7635  035140  005037  177572                  CLR     @#177572        ;TURN OFF MEMORY MANAGEMENT
 7636  035144                                  CLRVEC  #4              ;RESTORE TRAP 4 TO SUPERVISOR
 7637  035144  012700  000004                                                  MOV     #4,R0
 7638  035150  104436                                                          TRAP    C$CVEC
 7639  035152  005737  002352                  TST     NXMFLG          ;WAS THIS AN ERROR EXIT
 7640  035156  001417                          BEQ     25$             ;IF NOT, PROCEED.
 7641  035160                                  ERRDF   19,EMT22
 7642  035160  104455                                                          TRAP    C$ERDF
 7643  035162  000023                                                          .WORD   19
 7644  035164  036240                                                          .WORD   EMT22
 7645  035166  000000                                                          .WORD   0
 7646  035170                                  PRINTB  #FMT25,R4
 7647  035170  010446                                                          MOV     R4,-(SP)
 7648  035172  012746  036276                                                  MOV     #FMT25,-(SP)
 7649  035176  012746  000002                                                  MOV     #2,-(SP)
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                                                                                    MOV     SP,R0
                                                                                    TRAP    C$PNTB
                                                                                    ADD     #6,SP
                        JMP     85$
                25$:
                        CLEAR                   ;MACRO FOR MASTER CLEAR
                                                ;**** MACRO EXPANSION ****
                        JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                ;****                 ****

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

                        TST     DMTURN          ;IS INTERNAL LOOPBACK DESIRED?
                        BNE     30$             ;IF NOT, CLEAR INTERNAL LOOPBACK.
                        BIS     #LPLU,100$      ;SET LINE UNIT LOOPBACK.
                        BR      32$
                30$:
                        BIC     #LPLU,100$      ;CLEAR LINE UNIT LOOPBACK.
                32$:
                        CALL    $BASEI          ;BASE IN COMMAND.
                100$:           .WORD   0       ;MAINTENANCE BITS (LINE UNIT LOOP)
                                .WORD   BASE    ;BASE TABLE ADDRESS
                                .WORD   DMR     ;DMR MODE
                        ESCAPE  TST             ;IF ERROR, BR TO TEST END.
                                                                                    TRAP    C$ESCAPE
                                                                                    .WORD   L10074-.

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

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

                        CLR     TFLAG           ;CLEAR TRANSMIT FLAG
                        CLR     RFLAG           ;CLEAR RECEIVE FLAG
                        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
                        MOV     #10000,RSEL4    ;RECEIVE BUFFER ADDRESS (BITS 0-15)
                        MOV     #BIT14!10000,RSEL6 ;REC BUFFER ADDR BIT 16 SET AND 4K
                                                ;BYTE RECEIVE CHARACTER COUNT
                        CLR     TSEL4           ;TRANSMIT BUFFER ADDRESS (BITS 0-15)
                        MOV     #BIT14!10000,TSEL6 ;XMIT BUFFER ADDR BIT 16 SET AND 4K
                                                ;BYTE XMIT CHARACTER COUNT
                35$:
                        CALL    $BACC           ;ISSUE THE BUFFER ADDR/ CHAR COUNT COMMAND
```

```
7706  035360  000044                          .WORD   RQI!BACCR       ;COMMAND FOR BA/CC IN RECEIVE
7707  035362  000000                  RSEL4:  .WORD   0               ;BUFFER ADDRESS BITS 0-15
7708  035364  000000                  RSEL6:  .WORD   0               ;BUFFER ADDR BIT 16 + CHAR. COUNT
7709  035366                          ESCAPE  TST                     ;IF ERROR, END TEST
7710  035366  104410                                                          TRAP    C$ESCAPE
7711  035370  000646                                                          .WORD   L10074-.
7712
7713  035372                          CALL    $BACC                   ;ISSUE THE BUFFER ADDR/ CHAR COUNT COMMAND
7714  035376  000040                          .WORD   RQI.BACCT       ;COMMAND FOR BA/CC IN TRANSMIT
7715  035400  000000                  TSEL4:  .WORD   0               ;BUFFER ADDRESS BITS 0-15
7716  035402  000000                  TSEL6:  .WORD   0               ;BUFFER ADDR BIT 16 + CHAR. COUNT
7717  035404                          ESCAPE  TST                     ;IF ERROR, END TEST
7718  035404  104410                                                          TRAP    C$ESCAPE
7719  035406  000630                                                          .WORD   L10074-.
7720  035410                          40$:
7721  035410                          WAIT    RDO                     ;WAIT FOR RDO TO BE SET
7722                                                                  ;**** MACRO EXPANSION ****
7723  035410  004737  010276                 JSR     PC, $WAIT       ;CALL WAIT ROUTINE
7724  035414  000001                          .WORD   1               ;FLAG THAT WE'RE WAITING FOR RDO
7725                                                                  ;****                    ****
7726  035416                          ESCAPE  TST                     ;IF RDO NOT SET BEFORE TIMEOUT, END TEST
7727  035416  104410                                                          TRAP    C$ESCAPE
7728  035420  000616                                                          .WORD   L10074-.
7729
7730  035422  032777  000001  144604          BIT     #CNTRL,@SEL2    ;IS THIS A CONTROL OUT COMMAND?
7731  035430  001406                          BEQ     50$             ;NO - PROCEED
7732  035432                                  ERRDF   9,EMG9,ERRG2    ;UNEXPECTED CONTROL OUT.
7733  035432  104455                                                          TRAP    C$ERDF
7734  035434  000011                                                          .WORD   9
7735  035436  020040                                                          .WORD   EMG9
7736  035440  015124                                                          .WORD   ERRG2
7737  035442  000137  036226                  JMP     80$             ;EXIT
7738  035446                          50$:
7739  035446  032777  000004  144560          BIT     #RCV,@SEL2      ;IS THIS A TRANSMIT OR RECEIVE?
7740  035454  001040                          BNE     60$             ;BR FOR RECEIVE
7741  035456  005737  002520                  TST     TFLAG           ;IS THIS THE 1ST TRANSMIT DONE
7742  035462  001406                          BEQ     55$             ;IF YES, PROCEED
7743  035464                                  ERRDF   10,EMG10,ERRG2  ;MULTIPLE TRANSMITS
7744  035464  104455                                                          TRAP    C$ERDF
7745  035466  000012                                                          .WORD   10
7746  035470  020067                                                          .WORD   EMG10
7747  035472  015124                                                          .WORD   ERRG2
7748  035474  000137  036226                  JMP     80$             ;EXIT
7749  035500                          55$:
7750  035500  012737  177777  002520          MOV     #-1,TFLAG       ;FLAG THAT THE TRANSMIT IS DONE.
7751  035506  023777  035400  144522          CMP     TSEL4,@SEL4     ;IS THE BUFFER ADDRESS CORRECT?
7752  035514  001406                          BEQ     56$             ;IF OK, PROCEED WITH CHECK.
7753  035516                                  ERRDF   11,EMG11,ERRG2  ;BUFFER ADDRESS ERROR
7754  035516  104455                                                          TRAP    C$ERDF
7755  035520  000013                                                          .WORD   11
7756  035522  020116                                                          .WORD   EMG11
7757  035524  015124                                                          .WORD   ERRG2
7758  035526  000137  036226                  JMP     80$             ;EXIT
7759  035532                          56$:
7760  035532  023777  035402  144500          CMP     TSEL6,@SEL6     ;IS THE CHAR. COUNT CORRECT?
7761  035540  001502                          BEQ     70$             ;IF OK, PROCEED
```

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7762  035542                                    ERRDF   12,EMG12,ERRG2  ;CHARACTER COUNT ERROR - OR EXT MEM PROBLEM
7763  035542  104455                                                    TRAP    C$ERDF
7764  035544  000014                                                    .WORD   12
7765  035546  020141                                                    .WORD   EMG12
7766  035550  015124                                                    .WORD   ERRG2
7767  035552  000137  036226                    JMP     80$             ;EXIT
7768  035556                            60$:
7769  035556  005737  002570                    TST     RFLAG           ;IS THIS THE 1ST RECEIVE DONE
7770  035562  001406                            BEQ     61$             ;IF YES, PROCEED
7771  035564                                    ERRDF   13,EMG13,ERRG2  ;MULTIPLE RECEIVES
7772  035564  104455                                                    TRAP    C$ERDF
7773  035566  000015                                                    .WORD   13
7774  035570  020167                                                    .WORD   EMG13
7775  035572  015124                                                    .WORD   ERRG2
7776  035574  000137  036226                    JMP     80$             ;EXIT
7777  035600                            61$:
7778  035600  012737  177777  002570            MOV     #-1,RFLAG       ;FLAG THAT THE RECEIVE IS DONE.
7779  035606  023777  035362  144422            CMP     RSEL4,@SEL4     ;IS THE BUFFER ADDRESS CORRECT?
7780  035614  001405                            BEQ     62$             ;IF OK, PROCEED WITH CHECK.
7781  035616                                    ERRDF   11,EMG11,ERRG2  ;BUFFER ADDRESS ERROR
7782  035616  104455                                                    TRAP    C$ERDF
7783  035620  000013                                                    .WORD   11
7784  035622  020116                                                    .WORD   EMG11
7785  035624  015124                                                    .WORD   ERRG2
7786  035626  000577                            BR      80$             ;EXIT
7787  035630                            62$:
7788  035630  023777  035364  144402            CMP     RSEL6,@SEL6     ;IS THE CHAR. COUNT CORRECT?
7789  035636  001404                            BEQ     63$             ;IF OK, PROCEED
7790  035640                                    ERRDF   12,EMG12,ERRG2  ;CHARACTER COUNT ERROR
7791  035640  104455                                                    TRAP    C$ERDF
7792  035642  000014                                                    .WORD   12
7793  035644  020141                                                    .WORD   EMG12
7794  035646  015124                                                    .WORD   ERRG2
7795  035650                            63$:
7796  035650  005737  002346                    TST     SFLAG           ;WHICH EXTENDED ADDRESS ARE WE CHECKING?
7797  035654  001007                            BNE     65$             ;BR FOR BIT 17 CHECK
7798  035656  012700  004000                    MOV     #4000,R0        ;IN THE TEST OF BIT 16 WE SENT 4K BYTES
7799  035662  012701  120000                    MOV     #120000,R1      ;THE XMIT BUFFER BEGAN AT THIS VIRTUAL ADDR
7800                                                                    ;WHICH WILL MAP TO 200000
7801  035666  012702  130000                    MOV     #130000,R2      ;THE REC BUF. MAPS TO 210000
7802  035672  000406                            BR      66$             ;GO COMPARE THE XMIT AND REC BUFFERS
7803  035674                            65$:
7804  035674  012700  010000                    MOV     #10000,R0       ;IN THE TEST OF BIT 17 WE SENT 8K BYTES
7805  035700  012701  120000                    MOV     #120000,R1      ;THE XMIT BUFFER MAPS TO 200000
7806  035704  012702  140000                    MOV     #140000,R2      ;THE REC BUF. MAPS TO 400000
7807  035710                            66$:
7808  035710  012737  000001  177572            MOV     #1,@#177572     ;TURN MEMORY MANAGEMENT BACK ON.
7809  035716                            67$:
7810  035716  022122                            CMP     (R1)+,(R2)+     ;IS THE DATA THE SAME?
7811  035720  001003                            BNE     68$             ;IF NOT THERE IS A DATA ERROR.
7812  035722  005300                            DEC     R0              ;CHECK ENTIRE BUFFER
7813  035724  001374                            BNE     67$
7814  035726  000407                            BR      70$             ;IF DATA OK, PROCEED WITH TEST.
7815  035730                            68$:
7816  035730  005037  177572                    CLR     @#177572        ;TURN MEMORY MANAGEMENT OFF.
7817  035734                                    ERRDF   15,EMG15,ERRG2  ;DATA ERROR
```

```
 7818  035734  104455                                                                  TRAP    C$ERDF
 7819  035736  000017                                                                  .WORD   15
 7820  035740  020235                                                                  .WORD   EMG15
 7821  035742  015124                                                                  .WORD   ERRG2
 7822  035744  000530                      BR      80$             ;EXIT
 7823  035746                      70$:
 7824  035746  005037  177572              CLR     @#177572        ;TURN MEMORY MANAGEMENT OFF.
 7825  035752  042777  000213  144254      BIC     #RDO+RCV+CMD,@SEL2 ;CLEAR RDO, RCV & COMMMAND BITS (0,1)
 7826  035760  005737  002570              TST     RFLAG           ;IS THE RECEIVE DONE ? (IF DONE, FLAG = -1)
 7827  035764  001002                      BNE     71$             ;YES - SEE IF TRANSMIT DONE
 7828  035766  000137  035410              JMP     40$             ;NO - GO BACK AND DO IT.
 7829  035772                      71$:
 7830  035772  005737  002520              TST     TFLAG           ;IS THE TRANSMIT DONE ?
 7831  035776  001002                      BNE     72$             ;YES - SEE IF THERE IS MORE
 7832  036000  000137  035410              JMP     40$             ;NO - DO IT
 7833  036004                      72$:
 7834  036004  005737  002346              TST     SFLAG           ;HAVE WE ALREADY TESTED BIT 17
 7835  036010  001106                      BNE     80$             ;IF SO - END OF TEST
 7836
 7837  036012  012737  177777  002346      MOV     #-1,SFLAG       ;FLAG SO WE DON'T COME THIS WAY AGAIN.
 7838  036020  023727  002120  004200      CMP     L$HIMEM,#4200   ;IS THERE ENOUGH MEMORY TO TEST BIT 17?
 7839  036026  002477                      BLT     80$             ;IF NOT - END OF TEST.
 7840  036030  005037  002520              CLR     TFLAG           ;CLEAR FLAGS FOR NEXT TEST
 7841  036034  005037  002570              CLR     RFLAG
 7842                                      ;
 7843                                      ;SET UP TO TEST BIT 17, IF THERE IS ENOUGH MEMORY.
 7844                                      ;THIS TEST WILL TRANSMIT 8K BYTES STARTING AT PHYSICAL ADDRESS 200000
 7845                                      ;TO PHYSICAL ADDRESS 400000.  THE TRANSMITTED BUFFER STILL CONTAINS
 7846                                      ;THE TEST PATTERN GENERATED IN THE BIT 16 TEST.
 7847                                      ;
 7848  036040  005037  035362              CLR     RSEL4           ;RECEIVE BUFFER ADDRESS (BITS 0-15)
 7849  036044  012737  120000  035364      MOV     #BIT15!20000,RSEL6 ;REC BUFFER ADDR BIT 17 SET AND 8K
 7850                                                              ;BYTE RECEIVE CHARACTER COUNT
 7851  036052  005037  035400              CLR     TSEL4           ;TRANSMIT BUFFER ADDRESS (BITS 0-15)
 7852  036056  012737  060000  035402      MOV     #BIT14!20000,TSEL6 ;XMIT BUFFER ADDR BIT 16 SET AND 8K
 7853                                                              ;BYTE XMIT CHARACTER COUNT
 7854  036064  012701  010000              MOV     #10000,R1       ;COUNTER TO CLEAR 8K BYTES
 7855  036070  012704  140000              MOV     #140000,R4      ;VIRTUAL ADDRESS THAT WILL MAP INTO PAR 6
 7856                                                              ;WITH THE PHYSICAL ADDRESS 400000
 7857  036074  005037  002352              CLR     NXMFLG          ;ENSURE FLAG IS CLEAR
 7858  036100                              SETVEC  #4,#NOXMEM,#PRI07 ;SET UP TRAP TO VECTOR 4 (WILL SET FLAG)
 7859  036100  012746  000340                                                          MOV     #PRI07,-(SP)
 7860  036104  012746  023630                                                          MOV     #NOXMEM,-(SP)
 7861  036110  012746  000004                                                          MOV     #4,-(SP)
 7862  036114  012746  000003                                                          MOV     #3,-(SP)
 7863  036120  104437                                                                  TRAP    C$SVEC
 7864  036122  062706  000010                                                          ADD     #10,SP
 7865  036126  012737  000001  177572      MOV     #1,@#177572     ;TURN ON MEMORY MANAGEMENT
 7866  036134                      74$:
 7867  036134  005024                      CLR     (R4)+           ;CLEAR 400000 - 417776
 7868  036136  005737  002352              TST     NXMFLG          ;DOES A NXM TRAP 4 OCCUR?
 7869  036142  001002                      BNE     75$             ;IF YES, EXIT
 7870  036144  005300                      DEC     R0
 7871  036146  001372                      BNE     74$
 7872  036150                      75$:
 7873  036150  005037  177572              CLR     @#177572        ;TURN OFF MEMORY MANAGEMENT
```

```
7874  036154                                  CLRVEC  #4              ;RESTORE TRAP 4
7875  036154  012700  000004                                                  MOV     #4,R0
7876  036160  104436                                                         TRAP    C$CVEC
7877  036162  005737  002352                  TST     NXMFLG          ;WAS THIS AN ERROR EXIT?
7878  036166  001002                          BNE     76$             ;IF YES - REPORT ERROR
7879  036170  000137  035354                  JMP     35$             ;START THE SECOND TEST
7880  036174                          76$:
7881  036174                                  ERRDF   19,EMT22
7882  036174  104455                                                         TRAP    C$ERDF
7883  036176  000023                                                         .WORD   19
7884  036200  036240                                                         .WORD   EMT22
7885  036202  000000                                                         .WORD   0
7886  036204                                  PRINTB  #FMT25,R4
7887  036204  010446                                                         MOV     R4,-(SP)
7888  036206  012746  036276                                                 MOV     #FMT25,-(SP)
7889  036212  012746  000002                                                 MOV     #2,-(SP)
7890  036216  010600                                                         MOV     SP,R0
7891  036220  104414                                                         TRAP    C$PNTB
7892  036222  062706  000006                                                 ADD     #6,SP
7893  036226                          80$:
7894  036226                                  SHUTDN                  ;SHUTDOWN DMR
7895                                                                  ;**** MACRO EXPANSION ****
7896  036226  004737  012562                  JSR     PC, $HALT       ;DMR HALT ROUTINE.
7897                                                                  ;****                   ****
7898  036232                                  CALL    $ERROR          ;CHECK BASE TABLE AND REPORT ANY SOFT ERRORS
7899
7900  036236                          85$:
7901                                          .DSABL  LSB             ;DISABLE LOCAL SYMBOL BLOCK
7902  036236                          ENDTST
7903  036236                                                                  L10074:
7904  036236  104401                                                         TRAP    C$ETST
7905
7906
7907  036240  040503  023516  020124  EMT22:  .ASCIZ  /CAN'T ADDRESS EXTENDED MEMORY/
7908  036246  042101  051104  051505
7909  036254  020123  054105  042524
7910  036262  042116  042105  046440
7911  036270  046505  051117  000131
7912  036276  040445  042515  047515  FMT25:  .ASCIZ  /%AMEMORY ADDRESS %O6% DOES NOT RESPOND - TRAP 4%N/
7913  036304  054522  040440  042104
7914  036312  042522  051523  022440
7915  036320  033117  020045  047504
7916  036326  051505  047040  052117
7917  036334  051040  051505  047520
7918  036342  042116  026440  052040
7919  036350  040522  020120  022464
7920  036356  000116
7921                                          .EVEN
```

```
                                .SBTTL          TEST 15 - DMC MODE TEST

                                ;*****************************************************************************
                                ;*              TEST 15 - DMR-11
                                ;* DMC MODE
                                ;* IN THIS TEST THE DMR WILL TRANSMIT AND RECEIVE 7 BUFFERS.
                                ;*
                                ;*      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 $BUFFS.  THIS
                                ;*      SUBROUTINE WILL DETERMINE THE ADDRESS AND CHARACTER COUNT OF
                                ;*      SEVEN RECEIVE AND SEVEN TRANSMIT BUFFERS.  THE ROUTINE WILL
                                ;*      ATTEMPT TO USE AS LARGE BUFFERS AS POSSIBLE IN THE FOLLOWING
                                ;*      HIERARCHY:
                                ;*              A. IF THERE IS MEMORY MANAGEMENT, USE A PAGE ABOVE 32K.
                                ;*              B. IF THERE IS FREE MEMORY ABOVE THE SUPERVISOR GREATER
                                ;*                 THAN 2K BYTES, USE THAT MEMORY
                                ;*              C. IF NEITHER OF THE PRECEEDING TWO ARE POSSIBLE, USE
                                ;*                 THE 2K BYTE DEFAULT BUFFER WITHIN THIS DIAGNOSTIC.
                                ;*
                                ;*****************************************************************************
036360                          BGNTST
036360                                                                          T15::
036360  005737  002306                  TST     WMAINT          ;DO WE NEED TO WRITE MODEM
                                                                ;MAINTENANCE 1 OR 2 ?
036364  001035                  BNE     40$             ;IF YES, WE CAN'T RUN THIS TEST.
036366  012737  000007  002324  MOV     #7,BUFNUM       ;# OF RCV & XMIT BUFFERS.
036374  005037  002274          CLR     RESUME          ;FLAG NOT TO USE RESUME.
036400  012737  000001  002276  MOV     #1,DMCMDE       ;FLAG SET TO REQUEST DMC MODE.
036406  005037  002300          CLR     MNTMDE          ;FLAG NOT TO REQUEST MAINTENANCE MODE.

036412                          CALL    $BUFFS          ;DETERMINE 7 RCV &  7 XMIT BUFFERS

036416                          CLEAR                   ;MASTER CLEAR
                                                        ;**** MACRO EXPANSION ****
036416  004737  011070          JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                        ;****                   ****

036422                          ESCAPE  TST             ;IF ERROR, EXIT TEST
036422  104410                                                          TRAP    C$ESCAPE
036424  000034                                                          .WORD   L10075-.

                                                        ;ISSUE A DMR MODE BASEIN
                                                        ;IN DMR MODE, IF A INTERFACE IS REQUIRED
036426                          BASEIN                  ;TO BE WRITTEN - IT WILL BE DONE.
                                                        ;**** MACRO EXPANSION ****
036426  004737  011266          JSR     PC, $BASEI      ;CALL BASE IN ROUTINE WITH DEFAULTS
036432  004000                  .WORD   LPLU            ;SET LINE UNIT LOOP
036434  002640                  .WORD   BASE            ;BASE TABLE ADDRESS
036436  000522                  .WORD   DMR             ;DMR-11 MODE
                                                        ;****                   ****

036440                          ESCAPE  TST             ;IF ERROR, EXIT TEST
036440  104410                                                          TRAP    C$ESCAPE
```

```
 7978  036442  000016                                                          .WORD   L10075-.
 7979  036444                          SHUTDN                  ;HALT
 7980                                                          ;**** MACRO EXPANSION ****
 7981  036444  004737  012562          JSR     PC, $HALT       ;DMR HALT ROUTINE.
 7982                                                          ;****                ****
 7983  036450                          ESCAPE  TST             ;IF ERROR, EXIT TEST.
 7984  036450  104410                                                          TRAP    C$ESCAPE
 7985  036452  000006                                                          .WORD   L10075-.
 7986                                                          ;AFTER SETTING INTERFACE OR LOOPBACK MAINT.
 7987                                                          ;(CAN'T BE DONE IN DMC MODE), START IN
 7988                                                          ;DMC MODE.
 7989
 7990
 7991  036454                          CALL    $INOUT          ;THIS ROUTINE WILL MANAGE ALL THE DMR
 7992                                                          ;COMMANDS ISSUED IN THE INTERRUPT ROUTINES
 7993                                                          ;(FROM BASE IN UNTIL SHUT DOWN).  BESIDES
 7994                                                          ;CONTROLLING THE SOFTWARE TIMEOUT, THIS
 7995                                                          ;ROUTINE WILL ALSO CHECK THAT BUFFER
 7996                                                          ;CHARACTER COUNTS AND ADDRESSES ARE CORRECT
 7997                                                          ;AND THAT THE DATA IS CORRECT IN THOSE BUFFERS
 7998
 7999  036460                  40$:
 8000  036460                  ENDTST
 8001  036460                                                                  L10075:
 8002  036460  104401                                                          TRAP    C$ETST
 8003
 8004
 8005
```

```
                        .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    MASTER CLEAR    BASE IN RESUME
                        ;*      2 BA/CC IN RECEIVE
                        ;*      HALT    MASTER CLEAR    BASE IN RESUME
                        ;*      2 BA/CC IN RECEIVE
                        ;*      HALT    MASTER CLEAR    BASE IN RESUME
                        ;*      2 BA/CC IN RECEIVE
                        ;*      HALT    MASTER CLEAR    BASE IN RESUME
                        ;*      1 BA/CC IN RECEIVE
                        ;*      HALT    MASTER CLEAR    BASE IN RESUME
                        ;*      2 BA/CC IN TRANSMIT
                        ;*      HALT    MASTER CLEAR    BASE IN RESUME
                        ;*      2 BA/CC IN TRANSMIT
                        ;*      HALT    MASTER CLEAR    BASE IN RESUME
                        ;*      2 BA/CC IN TRANSMIT
                        ;*      HALT    MASTER CLEAR    BASE IN RESUME
                        ;*      1 BA/CC IN TRANSMIT
                        ;*      HALT    MASTER CLEAR    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.
                        ;*
                        ;*
                        ;*****************************************************************************
036462                  BGNTST
036462                                                                  T16::
036462  013737  002254  002336          MOV     DMTURN,TEMP1    ;SAVE OFF LOOP TYPE
036470  005037  002254                  CLR     DMTURN          ;FORCE INTERNAL LOOP
036474  012737  000007  002324          MOV     #7,BUFNUM       ;# OF RCV & XMIT BUFFERS.
036502  012737  000001  002274          MOV     #1,RESUME       ;FLAG SET TO REQUEST USE OF RESUME.
036510  005037  002276                  CLR     DMCMDE          ;FLAG CLEARED - DMR MODE.
036514  005037  002300                  CLR     MNTMDE          ;FLAG NOT TO REQUEST MAINTENANCE MODE.

036520                                  CALL    $BUFFS          ;DETERMINE 7 RCV &  7 XMIT BUFFERS
```

```
8062  036524                                  CLEAR                   ;MASTER CLEAR
8063                                                                  ;**** MACRO EXPANSION ****
8064  036524  004737  011070                  JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
8065                                                                  ;****                 ****
8066
8067  036530                                  ESCAPE  TST             ;IF ERROR, EXIT TEST
8068  036530  104410                                                                  TRAP    C$ESCAPE
8069  036532  000014                                                                  .WORD   L10076-.
8070
8071  036534                                  CALL    $INOUT          ;THIS ROUTINE WILL MANAGE ALL THE DMR
8072                                                                  ;COMMANDS ISSUED IN THE INTERRUPT ROUTINES
8073                                                                  ;(FROM BASE IN UNTIL SHUT DOWN).  BESIDES
8074                                                                  ;CONTROLLING THE SOFTWARE TIMEOUT, THIS
8075                                                                  ;ROUTINE WILL ALSO CHECK THAT BUFFER
8076                                                                  ;CHARACTER COUNTS AND ADDRESSES ARE CORRECT
8077                                                                  ;AND THAT THE DATA IS CORRECT IN THOSE BUFFERS
8078
8079
8080  036540  013737  002336  002254            MOV     TEMP1,DMTURN    ;RESTORE LOOP TYPE
8081  036546                          ENDTST
8082  036546                                                                          L10076:
8083  036546  104401                                                                  TRAP    C$ETST
8084
```

```
8085                                    .SBTTL          TEST 17 - DMR MODE INTERRUPT EXERCISE
8086
8087                                    ;*********************************************************************
8088                                    ;*              TEST 17 - DMR-11
8089                                    ;* INTERRUPT DRIVEN EXERCISE
8090                                    ;* IN THIS TEST 64 BUFFERS WILL BE TRANSMITTED AND RECEIVED
8091                                    ;*
8092                                    ;* ALL BA/CC OUTS RECEIVES AND TRANSMITS WILL BE ACCOUNTED FOR AND
8093                                    ;* THE CHARACTER COUNTS AND BUFFER ADDRESSES WILL BE CHECKED AGAINST
8094                                    ;* THE RECEIVE/TRANSMIT TABLE.
8095                                    ;*
8096                                    ;*      THE BUFFERS ARE DETERMINED IN THE SUBROUTINE $BUFFS.  THIS
8097                                    ;*      SUBROUTINE WILL DETERMINE THE ADDRESS AND CHARACTER COUNT OF
8098                                    ;*      64 RECEIVE AND 64 TRANSMIT BUFFERS.  THE ROUTINE WILL
8099                                    ;*      ATTEMPT TO USE AS LARGE BUFFERS AS POSSIBLE IN THE FOLLOWING
8100                                    ;*      HIERARCHY:
8101                                    ;*              A. IF THERE IS MEMORY MANAGEMENT, USE A PAGE ABOVE 32K.
8102                                    ;*              B. IF THERE IS FREE MEMORY ABOVE THE SUPERVISOR GREATER
8103                                    ;*                 THAN 2K BYTES, USE THAT MEMORY
8104                                    ;*              C. IF NEITHER OF THE PRECEEDING TWO ARE POSSIBLE, USE
8105                                    ;*                 THE 2K BYTE DEFAULT BUFFER WITHIN THIS DIAGNOSTIC.
8106                                    ;*
8107                                    ;*********************************************************************
8108  036550                            BGNTST
8109  036550                                                                          T17::
8110  036550  012737  000100  002324            MOV     #64.,BUFNUM     ;# OF RCV & XMIT BUFFERS.
8111
8112  036556  005037  002274            CLR     RESUME          ;FLAG CLEARED IN ORDER NOT TO USE RESUME.
8113  036562  005037  002276            CLR     DMCMDE          ;FLAG CLEARED TO ALLOW DMR MODE.
8114  036566  005037  002300            CLR     MNTMDE          ;FLAG NOT TO REQUEST MAINTENANCE MODE.
8115
8116  036572                            CALL    $BUFFS          ;DETERMINE 64 RCV &  64 XMIT BUFFERS
8117
8118  036576                            CLEAR                   ;MASTER CLEAR
8119                                                            ;**** MACRO EXPANSION ****
8120  036576  004737  011070            JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
8121                                                            ;****                    ****
8122
8123  036602                            ESCAPE  TST             ;IF ERROR, EXIT TEST
8124  036602  104410                                                          TRAP    C$ESCAPE
8125  036604  000012                                                          .WORD   L10077-.
8126
8127  036606                            CALL    $INOUT          ;THIS ROUTINE WILL MANAGE ALL THE DMR
8128                                                            ;COMMANDS ISSUED IN THE INTERRUPT ROUTINES
8129                                                            ;(FROM BASE IN UNTIL SHUT DOWN).  BESIDES
8130                                                            ;CONTROLLING THE SOFTWARE TIMEOUT, THIS
8131                                                            ;ROUTINE WILL ALSO CHECK THAT BUFFER
8132                                                            ;CHARACTER COUNTS AND ADDRESSES ARE CORRECT
8133                                                            ;AND THAT THE DATA IS CORRECT IN THOSE BUFFERS
8134
8135  036612                            CALL    $ERROR          ;CHECK BASE TABLE FOR SOFT ERRORS
8136
8137
8138  036616                            ENDTST
8139  036616                                                                  L10077:
8140  036616  104401                                                          TRAP    C$ETST
```

```
 8141
```

```
                                .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.
                                ;*
                                ;*************************************************************************
036620                          BGNTST
036620                                                                          T18::

036620  012737  000001  002324          MOV     #1,BUFNUM       ;# OF RCV & XMIT BUFFERS.

036626  005037  002274                  CLR     RESUME          ;FLAG CLEARED IN ORDER NOT TO USE RESUME.
036632  005037  002276                  CLR     DMCMDE          ;FLAG CLEARED TO ALLOW DMR MODE.
036636  005037  002300                  CLR     MAINTMDE        ;FLAG NOT TO REQUEST MAINTENANCE MODE.

036642                                  CALL    $BUFFS          ;DETERMINE 1 RCV &  1 XMIT BUFFER

036646                                  CLEAR                   ;MASTER CLEAR
                                                                ;**** MACRO EXPANSION ****
036646  004737  011070                  JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                                ;****                    ****

036652                                  ESCAPE  TST             ;IF ERROR, EXIT TEST
036652  104410                                                                  TRAP    C$ESCAPE
036654  000012                                                                  .WORD   L10100-.

036656                                  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

036662                                  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.
```

```
 8198
 8199
 8200  036666                          ENDTST
 8201  036666                                                    L10100:
 8202  036666  104401                                                    TRAP    C$ETST
 8203
```

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

                                ;*******************************************************************
                                ;*              TEST 19 - DMR-11
                                ;* MAINTENANCE MODE OPERATION
                                ;*
                                ;* THE BA/CC OUT RECEIVE AND TRANSMIT WILL BE ACCOUNTED FOR AND
                                ;* THE CHARACTER COUNTS AND BUFFER ADDRESSES WILL BE CHECKED AGAINST
                                ;* THE RECEIVE/TRANSMIT TABLE.
                                ;*
                                ;*      THE BUFFERS ARE DETERMINED IN THE SUBROUTINE $BUFFS.  THIS
                                ;*      SUBROUTINE WILL DETERMINE THE ADDRESS AND CHARACTER COUNT OF
                                ;*      ONE RECEIVE AND ONE TRANSMIT BUFFER.  THE ROUTINE WILL
                                ;*      ATTEMPT TO USE AS LARGE BUFFERS AS POSSIBLE IN THE FOLLOWING
                                ;*      HIERARCHY:
                                ;*              A. IF THERE IS MEMORY MANAGEMENT, USE A PAGE ABOVE 32K.
                                ;*              B. IF THERE IS FREE MEMORY ABOVE THE SUPERVISOR GREATER
                                ;*                 THAN 2K BYTES, USE THAT MEMORY
                                ;*              C. IF NEITHER OF THE PRECEEDING TWO ARE POSSIBLE, USE
                                ;*                 THE 2K BYTE DEFAULT BUFFER WITHIN THIS DIAGNOSTIC.
                                ;*
                                ;*******************************************************************
036670                          BGNTST
036670                                                                          T19::
036670  012737  000001  002324          MOV     #1,BUFNUM       ;# OF RCV & XMIT BUFFERS.

036676  005037  002274          CLR     RESUME          ;DON'T ALLOW RESUME
036702  005037  002276          CLR     DMCMDE          ;FLAG CLEARED TO ALLOW DMR MODE.
036706  012737  000001  002300  MOV     #1,MNTMDE       ;FLAG SET TO REQUEST MAINTENANCE MODE.

036714                          CALL    $BUFFS          ;DETERMINE 1 RCV &  1 XMIT BUFFER

036720                          CLEAR                   ;MASTER CLEAR
                                                        ;**** MACRO EXPANSION ****
036720  004737  011070          JSR     PC, $MSCLR      ;ISSUE A DMR MASTER CLEAR
                                                        ;****                 ****

036724                          ESCAPE  TST             ;IF ERROR, EXIT TEST
036724  104410                                                          TRAP    C$ESCAPE
036726  000012                                                          .WORD   L10101-.

036730                          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

036734                          CALL    $ERROR          ;CHECK BASE TABLE FOR SOFT ERRORS


036740                  ENDTST
036740                                                          L10101:
036740  104401                                                          TRAP    C$FTST
```

```
8259                                    .SBTTL  HARDWARE PARAMETER CODING SECTION
8260
8261
8262                                    ;*****************************************************************************
8263                                    ;  THE HARDWARE PARAMETER CODING SECTION CONTAINS MACROS
8264                                    ;  THAT ARE USED BY THER SUPERVISOR TO BUILD P-TABLES.  THE
8265                                    ;  MACROS ARE NOT EXECUTED AS MACHINE INSTRUCTIONS BUT ARE
8266                                    ;  INTERPRETED BY THE SUPERVISOR AS DATA STRUCTURES.  THE
8267                                    ;  MACROS ALLOW THE SUPERVISOR TO ESTABLISH COMMUNICATIONS
8268                                    ;  WITH THE OPERATOR.
8269                                    ;*****************************************************************************
8270
8271  036742                                    BGNHRD
8272  036742  000015                                                        .WORD L10102-L$HARD/2
8273  036744                                                          L$HARD::
8274
8275  036744                                    GPRMA   P1,2,0,160000,177776,YES
8276  036744  001031                                                    .WORD   T$CODE
8277  036746  036776                                                    .WORD   P1
8278  036750  160000                                                    .WORD   T$LOLIM
8279  036752  177776                                                    .WORD   T$HILIM
8280  036754                                    GPRMA   P2,4,0,0,776,YES
8281  036754  002031                                                    .WORD   T$CODE
8282  036756  037014                                                    .WORD   P2
8283  036760  000000                                                    .WORD   T$LOLIM
8284  036762  000776                                                    .WORD   T$HILIM
8285  036764                                    GPRMD   P3,20,0,7,0,7,YES
8286  036764  010032                                                    .WORD   T$CODE
8287  036766  037035                                                    .WORD   P3
8288  036770  000007                                                    .WORD   7
8289  036772  000000                                                    .WORD   T$LOLIM
8290  036774  000007                                                    .WORD   T$HILIM
8291
8292  036776                                    ENDHRD
8293                                                                    .EVEN
8294  036776                                                          L10102:
8295
8296  036776  051503  020122  042101  P1:       .ASCIZ  /CSR ADDRESS: /
8297  037004  051104  051505  035123
8298  037012  000040
8299  037014  042526  052103  051117  P2:       .ASCIZ  /VECTOR ADDRESS: /
8300  037022  040440  042104  042522
8301  037030  051523  020072     000
8302  037035     124  051505  020124  P3:       .ASCII  /TEST CONFIGURATION -/<CR><LF>
8303  037042  047503  043116  043511
8304  037050  051125  052101  047511
8305  037056  020116  006455     012
8306  037063     040  030040  036440            .ASCII  /  0 = INTERNAL (NO CONNECTOR)/<CR><LF>
8307  037070  044440  052116  051105
8308  037076  040516  020114  047050
8309  037104  020117  047503  047116
8310  037112  041505  047524  024522
8311  037120  005015
8312  037122  020040  020061  020075            .ASCII  /  1 - H3254 - V.35      (NOTE:  MODE 1-4 ALLOWS/<CR><LF>
8313  037130  031510  032462  020064
8314  037136  020055  027126  032463
```

```
 8315  037144  020040  020040  020040
 8316  037152  047050  052117  035105
 8317  037160  020040  047515  042504
 8318  037166  030440  032055  040440
 8319  037174  046114  053517  006523
 8320  037202     012
 8321  037203     040  031040  036440          .ASCII  /  2 = H3254 - INTEGRAL   PROGRAM INTERFACE SELECTION)/
 8322  037210  044040  031063  032065
 8323  037216  026440  044440  052116
 8324  037224  043505  040522  020114
 8325  037232  020040  051120  043517
 8326  037240  040522  020115  047111
 8327  037246  042524  043122  041501
 8328  037254  020105  042523  042514
 8329  037262  052103  047511  024516
 8330  037270  005015  020040  020063          .ASCII  <CR><LF>/  3 = H3255 - RS232C/<57>/423/<CR><LF>
 8331  037276  020075  031510  032462
 8332  037304  020065  020055  051522
 8333  037312  031462  041462  032057
 8334  037320  031462  005015
 8335
 8336  037324  020040  020064  020075          .ASCII  /  4 = H3255 - RS422/<CR><LF>
 8337  037332  031510  032462  020065
 8338  037340  020055  051522  031064
 8339  037346  006462     012
 8340  037351     040  032440  036440          .ASCII  /  5 = CABLE AND SW PACK INTERFACE SELECTED/<CR><LF>
 8341  037356  041440  041101  042514
 8342  037364  040440  042116  051440
 8343  037372  020127  040520  045503
 8344  037400  044440  052116  051105
 8345  037406  040506  042503  051440
 8346  037414  046105  041505  042524
 8347  037422  006504     012
 8348  037425     040  020040  020040          .ASCII  /      (V.35-H3250, INTEGRAL-BC55A-10,/
 8349  037432  024040  027126  032463
 8350  037440  044055  031063  030065
 8351  037446  020054  047111  042524
 8352  037454  051107  046101  041055
 8353  037462  032503  040465  030455
 8354  037470  026060
 8355  037472  051040  031123  031063          .ASCII  / RS232C-H325, RS423/<57>/422-H3251)/<CR><LF>
 8356  037500  026503  031510  032462
 8357  037506  020054  051522  031064
 8358  037514  027463  031064  026462
 8359  037522  031510  032462  024461
 8360  037530  005015
 8361  037532  020052  042523  042514          .ASCII  /* SELECT THE FOLLOWING ONLY IF THE MODEM SUPPORTS LOOPBACK */
 8362  037540  052103  052040  042510
 8363  037546  043040  046117  047514
 8364  037554  044527  043516  047440
 8365  037562  046116  020131  043111
 8366  037570  052040  042510  046440
 8367  037576  042117  046505  051440
 8368  037604  050125  047520  052122
 8369  037612  020123  047514  050117
 8370  037620  040502  045503  025040
```

```
 8371  037626  005015  020040  020066          .ASCII  <CR><LF>/  6 = LOCAL LOOP/<CR><LF>
 8372  037634  020075  047514  040503
 8373  037642  020114  047514  050117
 8374  037650  005015
 8375  037652  020040  020067  020075          .ASCIZ  /  7 = REMOTE LOOP/<CR><LF>
 8376  037660  042522  047515  042524
 8377  037666  046040  047517  006520
 8378  037674  000012
 8379                                          .EVEN
 8380
```

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

037676                                  BGNSFT
037676  000005                                                          .WORD L10103-L$SOFT/2
037700                                                          L$SOFT::

037700                                  GPRMD   S1,0,0,7,1,5,YES
037700  000032                                                          .WORD   T$CODE
037702  037712                                                          .WORD   S1
037704  000007                                                          .WORD   7
037706  000001                                                          .WORD   T$LOLIM
037710  000005                                                          .WORD   T$HILIM

037712                                  ENDSFT
                                                                        .EVEN
037712                                                          L10103:

037712  042523  042514  052103  S1:     .ASCII  /SELECTABLE PROGRAM LOOP TIME-OUT VARIABLE/<CR><LF>
037720  041101  042514  050040
037726  047522  051107  046501
037734  046040  047517  020120
037742  044524  042515  047455
037750  052125  053040  051101
037756  040511  046102  006505
037764     012
037765     133  042522  042506          .ASCIZ  /[REFER TO LISTING 6.3.13]   (MAX=5; MIN=1) /
037772  020122  047524  046040
040000  051511  044524  043516
040006  033040  031456  030456
040014  056463  020040  024040
040022  040515  036530  035465
040030  046440  047111  030475
040036  020051     000
        040042                          .EVEN

                                ;********************      PATCH AREA      *********************************
040042                          PATCH:
        040066                          .=.+20.
040066  000240                          NOP
040070  000240                          NOP
040072  000240                          NOP
                                ;*****************************************************************************
040074                          ENDMOD

040074                                  LASTAD
                                                                        .EVEN
```

```
 8437  040074  00000C                                                  .WORD   0
 8438  040076  000000                                                  .WORD   0
 8439  040100                        L$LAST::
 8440          000001                .END
```

```
A       = 000044            1640#   5340    5401    5447    5451
ADR     = 000020 G          1516#
ASSEMB= 000010              1231
AX3       002304            1724#   2533    4177*   4181*   4186*   4191*   4196*   4202*   4384
BACCR   = 000004            1612#   4359    4570    6636    6712    6946    7145    7206    7284    7386    7706
BACCT   = 000000            1608#   4361    4590    6334    6440    6644    6727    6845    6957    7220    7398    7714
BASE      002640            1857#   2840    3607    3609    3614    3616    3623    3625    3630    3632    3639    3641    3646
                            3648    3655    3657    3662    3664    4418    5313    5324    5336    5338    5340    5342    5344
                            5374    5385    5397    5399    5401    5403    5405    5424    5428    5435    5439    5447    5451
                            5458    5462    5469    5473    5561    5586    5600    5622    5651    5693    5695    5697    5699
                            5701    5729    5735    5739    5746    5750    5757    5761    5768    5772    5779    5783    5876
                            5918    5937    5988    6011    6044    6123    6296    6404    6475    6477    6499    6501    6544
                            6613    6693    6792    6927    7031    7042    7196    7271    7363    7673    7972
BASEI   = 000003            1611#   2483    3300    4363    4531    4646
BASEUP= 020000              1576#
BIGBUF    004240            1869#   3176
BIT0    = 000001 G          1489#   1601    2396    3173    3244    4557    4577    5139    5586    5622
BIT00   = 000001 G          1478#   1489
BIT01   = 000002 G          1477#   1488
BIT02   = 000004 G          1476#   1487
BIT03   = 000010 G          1475#   1486
BIT04   = 000020 G          1474#   1485
BIT05   = 000040 G          1473#   1484
BIT06   = 000100 G          1472#   1483
BIT07   = 000200 G          1471#   1482
BIT08   = 000400 G          1470#   1481
BIT09   = 001000 G          1469#   1480
BIT1    = 000002 G          1488#   1600    6011
BIT10   = 002000 G          1468#   1558    1583    1584
BIT11   = 004000 G          1467#   1557    1581
BIT12   = 010000 G          1466#   1556    1578    1580
BIT13   = 020000 G          1465#   1555    1576    4476    4486
BIT14   = 040000 G          1464#   1554    4465    4482    4486    4659    4670    6567    6638    6729    7699    7702    7852
BIT15   = 100000 G          1463#   1553    4670    6567    6638    6729    7849
BIT2    = 000004 G          1487#   1569    1598    1599
BIT3    = 000010 G          1486#   1596    1597    4186
BIT4    = 000020 G          1485#   1566    1595    4181    5324    5385    5899    5918    5956    6839
BIT5    = 000040 G          1484#   1565    1594
BIT6    = 000100 G          1483#   1563    1573    1592    1593    4191
BIT7    = 000200 G          1482#   1562    1572    1591    4196
BIT8    = 000400 G          1481#   1560    1586    1587    1590
BIT9    = 001000 G          1480#   1559    1585
BOE     = 000400 G          1520#
BSEL0   = 002232            1685#   2483*   2525*   2581*   2703*   2781*   3300*   4541*   4546*   4550*   4565*   4570*   4585*
                            4590*
BSEL1     002242            1686#   4095*   4096*
BSEL2   = 002234            1687#
BSEL3     002244            1688#   2389*   3553    3563    3581    4099*   4100*   5238    5248    5257
BSEL4   = 002236            1689#
BSEL5     002246            1690#   4103*   4104*
BSEL6   = 002240            1691#   2508    4939    4991    4995    5105    6153    6202    6235
BSEL7     002250            1692#   2533*   4107*   4108*   4384*   4940    4992    4996    5109
BUFNUM    002324            1753#   3143    3148    3182    3184    3225    3236    3283    3284    3285    3286    3339    3457
                            3474    3475    3476    3477    7950*   8055*   8110*   8168*   8228*
BUFSIZ    002322            1752#   3145*   3150*   3153*   3197*   3198*   3200*   3228    3229    3240    3242    3464
CD      - 002000            1584#
```

```
CHIPNO  002414          1801#
CLRNO   002400          1791#   2396    2409*   4028*
CMD     = 000007        1629#   2639    2940    4736    6349    6370    6379    6592    6672    6754    7071    7124    7175
                        7250    7314    7516    7825
CNTRL   = 000004        1609#   2216    2224    2519    2581    2621    2923    4365    4550    4619    6352    6453    6558
                        6575    6629    6654    6720    6737    6879    6951    6970    7035    7054    7086    7107    7139
                        7158    7214    7233    7278    7297    7415    7730
COUNT   002416          1802#   2169*   2191*   6861
CR      = 000015        1662#   8302    8306    8312    8330    8336    8340    8355    8371    8375    8408
CSR     002232          1680#   1684    1685    4094*   4283    4962
CTS     = 010000        1580#
C$AU    = 000052        1231#
C$AUTO= 000061          1231#   4306
C$BRK   = 000022        1231#   2190    2314    2418    3305
C$BSEG= 000004          1231#
C$BSUB= 000002          1231#   4923    4968    5099    5299    5359    5547    5637    5863    5932    5975    6025    6110
                        6179    6283    6391    6531    6600    6680    7020    7079    7132    7183    7258
C$CEFG= 000045          1231#
C$CLCK= 000062          1231#
C$CLEA= 000012          1231#   4332
C$CLOS= 000035          1231#
C$CLP1= 000006          1231#
C$CVEC= 000036          1231#   3162    4039    4294    4841    7564    7638    7876
C$DCLN= 000044          1231#   4301    4836
C$DODU= 000051          1231#   4299    4834
C$DRPT= 000024          1231#
C$DU    = 000053        1231#   4777
C$EDIT= 000003          1231#   1310
C$ERDF= 000055          1231#   2207    2227    2329    2433    2624    2633    2926    2935    3328    3354    3373    4374
                        4613    4628    4651    4664    4699    4708    4718    4855    5048    5072    5120    5265    5329
                        5348    5390    5409    5590    5626    5705    5902    5921    5959    6014    6157    6206    6355
                        6364    6456    6465    6481    6578    6587    6657    6666    6740    6749    6867    6882    6891
                        6973    6983    7057    7066    7110    7119    7161    7170    7236    7245    7300    7309    7418
                        7432    7442    7451    7463    7473    7482    7500    7507    7642    7733    7744    7754    7763
                        7772    7782    7791    7818    7882
C$ERHR= 000056          1231#
C$ERRO= 000060          1231#
C$ERSF= 000054          1231#
C$ERSO= 000057          1231#   2863
C$ESCA= 000010          1231#   5236    5255    5306    5318    5366    5379    5554    5566    5577    5584    5613    5620
                        5644    5656    5667    5684    5691    5870    5881    5890    5916    5948    5982    5993    6002
                        6009    6033    6047    6053    6117    6128    6140    6150    6167    6190    6199    6290    6301
                        6310    6327    6345    6377    6398    6409    6418    6435    6451    6538    6549    6556    6607
                        6618    6627    6687    6698    6707    6718    6786    6810    6821    6830    6851    6859    6921
                        6932    6941    6968    7052    7105    7156    7190    7201    7212    7231    7265    7276    7295
                        7352    7366    7371    7380    7392    7404    7661    7676    7681    7690    7710    7718    7727
                        7963    7977    7984    8068    8124    8182    8242
C$ESEG= 000005          1231#
C$ESUB= 000003          1231#   4963    5095    5147    5355    5416    5633    5712    5928    5971    6021    6062    6175
                        6222    6387    6489    6596    6676    6758    7075    7128    7179    7254    7318
C$ETST= 000001          1231#   4845    5151    5272    5420    5715    6068    6226    6492    6762    6904    6999    7322
                        7534    7904    8002    8083    8140    8202    8258
C$EXIT= 000032          1231#
C$GETB= 000026          1231#
C$GETW= 000027          1231#
C$GMAN= 000043          1231#
```

```
C$GPHR= 000042            1231#   4076
C$GPLO= 000030            1231#
C$GPRI= 000040            1231#
C$INIT= 000011            1231#   4234
C$INLP= 000020            1231#
C$MANI= 000050            1231#
C$MEM = 000031            1231#   3164
C$MSG = 000023            1231#   3496    3529    3592    3673    3702    3730    3745    3759    3775    5482    5792    6244
                          6509
C$OPEN= 000034            1231#
C$PNTB= 000014            1231#   2222    2240    2617    3438    3446    3454    3461    3468    3484    3492    3508    3517
                          3525    3540    3549    3559    3569    3577    3587    3604    3620    3636    3652    3668    3683
                          3691    3698    3710    3718    3726    3741    3755    3771    4091    4119    4223    4935    4950
                          5060    5084    5133    5244    5432    5443    5455    5466    5477    5725    5733    5743    5754
                          5765    5776    5787    6240    6505    7651    7891
C$PNTF= 000017            1231#   4772
C$PNTS= 000016            1231#
C$PNTX= 000015            1231#   4867
C$QIO = 000377            1231#
C$RDBU= 000007            1231#
C$REFG= 000047            1231#   4043    4048    4053    4058
C$RESE= 000033            1231#   4766
C$REVI= 000003            1231#   1309
C$RFLA= 000021            1231#
C$RPT = 000025            1231#
C$SEFG= 000046            1231#
C$SPRI= 000041            1231#   3095    3297    3412    4022    7581
C$SVEC= 000037            1231#   3082    4142    4149    4280    4811    7558    7611    7863
C$TPRI= 000013            1231#
DDMC  = 000010            1616#
DFPTBL  002174 G          1409#
DIAGMC= 000000            1231
DISCON= 000100            1592#
DMCMDE  002276            1719#   3012    4027*   4420    4496    4525    7952*   8057*   8113*   8171*   8231*
DMR   = 000522            1587#   4422    5314    5562    5601    5652    5877    5938    5989    6045    6124    6297    6405
                          6545    6567    6614    6694    6793    6928    7032    7043    7197    7272    7364    7674    7973
DMRFLG  002260            1706#   2513*   2516*   2597*   2603    2605*   7089*
DMRRUN= 000040            1594#   2630    4623
DMRVEC  002226            1678#   4122*   4140
DMTURN  002254            1698#   3018    4153*   4179    4184    4189    4194    4208    4210    4213    4215    4394    4437
                          6035    7354    7664    8053    8054*   8080*
DMTVEC  002230            1679#   4123*   4132*   4147
DTR   = 000100            1593#   4397    4401
DXERR = 000007            1615#   5607
EF.CON- 000036 G          1496#   4057
EF.NEW= 000035 G          1497#   4052
EF.PWR= 000034 G          1498#
EF.RES= 000037 G          1495#   4047
EF.STA= 000040 G          1494#   4042
EMG1    017716            2209    2351    2435    3926#
EMG10   020067            3945#   7434    7746
EMG11   020116            3949#   4666    4701    4720    7444    7475    7756    7784
EMG12   020141            3356    3953#   4710    7453    7484    7765    7793
EMG13   020167            3957#   7465    7774
EMG14   020215            3961#   7502
EMG15   020235            3375    3964#   7509    7820
```

```
EMG16   020250            3966#   4633
EMG17   020301            3971#   4376
EMG18   020353            3979#   4615
EMG19   020402            3983#   6869
EMG2    017727            3330    3928#
EMG8    017774            2626    3935#   6357    6458    6580    6659    6742    6884    6975    7059    7112    7163    7238
                          7302
EMG9    020040            2229    2635    3941#   4630    6366    6467    6589    6668    6751    6893    6985    7068    7121
                          7172    7247    7311    7420    7735
EMS3    012540            2865    2876#
EMS4    012724            2928    2937    2945#
EMT0    024120            4857    4874#
EMT1    025472            5050    5074    5185#
EMT10   030604            5923    6074#
EMT11   030632            5961    6078#
EMT12   030666            6016    6083#
EMT13   031226            6159    6208    6247#
EMT2    025512            5122    5188#
EMT20   032026            6483    6511#
EMT22   036240            7644    7884    7907#
EMT3    025646            5267    5274#
EMT4    026374            5331    5484#
EMT5    026421            5350    5411    5488#
EMT6    026467            5392    5495#
EMT7    027574            5592    5628    5795#
EMT8    027625            5707    5800#
EMT9    030554            5904    6070#
END     021510            4061    4228    4231#
ERRFLG  002362            1779#   2168*   2211*   2231*   2249    2297*   2333*   2341
ERRG1   014616 G          3331    3432#
ERRG10  016164 G          3357    3734#
ERRG11  016216 G          3748#
ERRG12  016250 G          3376    3762#
ERRG2   015124 G          2210    2230    2332    2627    2636    2929    2938    3500#   4377    4616    4631    4667    6358
                          6367    6459    6468    6581    6590    6660    6669    6743    6752    6885    6894    6976    6986
                          7060    7069    7113    7122    7164    7173    7239    7248    7303    7312    7421    7435    7445
                          7454    7466    7476    7485    7503    7510    7736    7747    7757    7766    7775    7785    7794
                          7821
ERRG3   015240 G          2436    3532#   5268
ERRG4   015470 G          2866    3596#
ERRG7   015764 G          3678#   4721
ERRG8   016062 G          3705#   4702    4711
ERROR   002366            1785#   2216    2519    4025*   6558*   6593*   6629*   6673*   6720*   6755*   6951*   6989*   7035*
                          7072*   7086*   7125*   7139*   7176*   7214*   7251*   7278*   7315*
ERRT1   026154 G          5351    5412    5423#
ERRT2   031174 G          6160    6209    6232#
ERRT3   027266 G          5708    5718#
ERRT4   031770 G          6484    6496#
EVL   = 000004 G          1514#
EXERR = 000006            1614#   5571
E$END = 002100            1231#
E$LOAD= 000035            1231#   1333
FINIT1  021512            4088    4235#
FINIT2  021601            4116    4245#
FINIT3  021670            4220    4255#
FLAG    002344            1766#   4969*   5043    5046*   5067    5070*   5100*   5115    5118*
```

CROSS REFERENCE TABLE -- USER SYMBOLS

```
FMDROP  023670            4769    4780#
FMG1    016302            3443    3514    3546    3782#   5722
FMG10   016715            3665    3830#
FMG11   016753            3707    3836#
FMG12   017005            3680    3841#
FMG13   017036            3688    3715    3846#
FMG14   017112            3723    3854#
FMG15   017166            3695    3862#
FMG16   017215            3738    3866#
FMG17   017274            3752    3874#
FMG18   017347            3768    3882#
FMG19   017436            3584    3892#   5241
FMG2    016334            3451    3522    3787#
FMG21   017461            3458    3896#
FMG22   017527            3465    3903#
FMG23   017554            3481    3907#
FMG24   017635            3489    3916#
FMG3    016366            3435    3505    3537    3601    3792#
FMG4    016440            3556    3799#
FMG5    016471            3566    3574    3804#
FMG7    016522            3617    3809#   6502
FMG8    016573            3633    3816#
FMG9    016644            3649    3823#
FMS1    010620            2219    2255#
FMS2    010653            2237    2260#
FMS3    011746            2614    2645#
FMT0    024147            4864    4878#
FMT1    025204            4932    5152#
FMT11   027662            5730    5806#
FMT12   027713            5740    5811#
FMT13   027750            5751    5816#
FMT14   030005            5762    5821#
FMT15   030042            5773    5826#
FMT16   030077            5784    5831#
FMT19   031252            6237    6253#
FMT2    025253            4947    5159#
FMT25   036276            7648    7888    7912#
FMT3    025330            5057    5081    5167#
FMT4    025414            5130    5176#
FMT5    026526            5429    5502#
FMT6    026557            5440    5507#
FMT7    026610            5452    5512#
FMT8    026641            5463    5517#
FMT9    026672            5474    5522#
FRSPAS  002266            1712#   4034*   4068*
FRSTIM  002264            1711#   4031    4033*
F$AU    = 000015          1231#
F$AUTO= 000020            1231#   4273    4305
F$BGN   = 000040          1231#   1234    3432    3500    3532    3596    3678    3705    3734    3748    3762    3998    4018
                          4273    4323    4345    4607    4746    4763    4804    4844    4849    4920    4922    4962    4967
                          5094    5098    5146    5150    5229    5236    5255    5271    5296    5298    5306    5318    5354
                          5358    5366    5379    5415    5419    5423    5544    5546    5554    5566    5577    5584    5613
                          5620    5632    5636    5644    5656    5667    5684    5691    5711    5714    5718    5860    5862
                          5870    5881    5890    5916    5927    5931    5948    5970    5974    5982    5993    6002    6009
                          6020    6024    6033    6047    6053    6061    6067    6106    6109    6117    6128    6140    6150
                          6167    6174    6178    6190    6199    6221    6225    6232    6280    6282    6290    6301    6310
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                        6327    6345    6377    6386    6390    6398    6409    6418    6435    6451    6488    6491    6496
                        6528    6530    6538    6549    6556    6595    6599    6607    6618    6627    6675    6679    6687
                        6698    6707    6718    6757    6761    6779    6786    6810    6821    6830    6851    6859    6903
                        6914    6921    6932    6941    6968    6998    7017    7019    7052    7074    7078    7105    7127
                        7131    7156    7178    7182    7190    7201    7212    7231    7253    7257    7265    7276    7295
                        7317    7321    7334    7352    7366    7371    7380    7392    7404    7533    7550    7661    7676
                        7681    7690    7710    7718    7727    7903    7946    7963    7977    7984    8001    8052    8068
                        8082    8109    8124    8139    8166    8182    8201    8227    8242    8257    8272    8394    8434
F$CLEA= 000007          1231#   4323    4331
F$DU  = 000016          1231#   4763    4776
F$END = 000041          1231#   1234    3497    3530    3593    3674    3703    3731    3746    3760    3776    4235    4307
                        4333    4602    4741    4753    4778    4804    4844    4846    4873    4920    4922    4962    4964
                        4967    5094    5096    5098    5146    5148    5150    5152    5229    5236    5255    5271    5273
                        5296    5298    5306    5318    5354    5356    5358    5366    5379    5415    5417    5419    5421
                        5483    5544    5546    5554    5566    5577    5584    5613    5620    5632    5634    5636    5644
                        5656    5667    5684    5691    5711    5713    5714    5716    5793    5860    5862    5870    5881
                        5890    5916    5927    5929    5931    5948    5970    5972    5974    5982    5993    6002    6009
                        6020    6022    6024    6033    6047    6053    6061    6063    6067    6069    6106    6109    6117
                        6128    6140    6150    6167    6174    6176    6178    6190    6199    6221    6223    6225    6227
                        6245    6280    6282    6290    6301    6310    6327    6345    6377    6386    6388    6390    6398
                        6409    6418    6435    6451    6488    6490    6491    6493    6510    6528    6530    6538    6549
                        6556    6595    6597    6599    6607    6618    6627    6675    6677    6679    6687    6698    6707
                        6718    6757    6759    6761    6763    6779    6786    6810    6821    6830    6851    6859    6903
                        6905    6914    6921    6932    6941    6968    6998    7000    7017    7019    7052    7074    7076
                        7078    7105    7127    7129    7131    7156    7178    7180    7182    7190    7201    7212    7231
                        7253    7255    7257    7265    7276    7295    7317    7319    7321    7323    7334    7352    7366
                        7371    7380    7392    7404    7533    7535    7550    7661    7676    7681    7690    7710    7718
                        7727    7903    7905    7946    7963    7977    7984    8001    8003    8052    8068    8082    8084
                        8109    8124    8139    8141    8166    8182    8201    8203    8227    8242    8257    8259    8295
                        8407    8434
F$HARD= 000004          1231#   8272    8293
F$HW  = 000013          1231#   1407    1424
F$INIT= 000006          1231#   4018    4233
F$JMP = 000050          1231#
F$MOD = 000000          1231#   1234    8434
F$MSG = 000011          1231#   3432    3495    3500    3528    3532    3591    3596    3672    3678    3701    3705    3729
                        3734    3744    3748    3758    3762    3774    5423    5481    5718    5791    6232    6243    6496
                        6508
F$PROT= 000021          1231#   3998    4005
F$PWR = 000017          1231#
F$RPT = 000012          1231#
F$SEG = 000003          1231#
F$SOFT= 000005          1231#   8394    8405
F$SRV = 000010          1231#   4345    4600    4607    4739    4746    4751    4849    4871
F$SUB = 000002          1231#   4923    4962    4968    5094    5099    5146    5299    5354    5359    5415    5547    5632
                        5637    5711    5863    5927    5932    5970    5975    6020    6025    6061    6110    6174    6179
                        6221    6283    6386    6391    6488    6531    6595    6600    6675    6680    6757    7020    7074
                        7079    7127    7132    7178    7183    7253    7258    7317
F$SW  = 000014          1231#   1439    1446
F$TEST- 000001          1231#   4805    4844    4921    5150    5230    5271    5297    5419    5545    5714    5861    6067
                        6107    6225    6281    6491    6529    6761    6780    6903    6915    6998    7018    7321    7335
                        7533    7551    7903    7947    8001    8053    8082    8110    8139    8167    8201    8228    8257
GETPRM  020630          4060    4070#   4079
G$CNTO= 000200          1231#
G$DELM- 000372          1231#   2195    2318    2422    3315
G$DISP- 000003          1231#
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G$EXCP= 000400           1231#
G$HILI= 000002           1231#
G$LOLI= 000001           1231#
G$NO  = 000000           1231#
G$OFFS= 000400           1231#  8276   8281   8286   8398
G$OFSI= 000376           1231#  8276   8281   8286   8398
G$PRMA= 000001           1231#  8276   8281
G$PRMD= 000002           1231#  8286   8398
G$PRML= 000000           1231#
G$RADA= 000140           1231#
G$RADB= 000000           1231#
G$RADD= 000040           1231#
G$RADL= 000120           1231#
G$RADO= 000020           1231#  8276   8281   8286   8398
G$XFER= 000004           1231#
G$YES = 000010           1231#  8276   8281   8286   8398
HALTC = 001000           1585#  2932   4621   7063   7116   7167   7242   7306
HDX   = 002000           1583#  5944
HELP  = 000000           1224#  1251   1351   1392   1904
HICRC   002404           1797#  4979*  5020*  5026   5027*  5028*  5064*  5065   5079
HIWORD  002410           1799#  4992*  4996*  5021*  5065   5078
HLT   = 000002           1610#  2900   4371   4516   4565   4585
HOE   = 100000 G         1527#
IBE   = 010000 G         1524#
IDU   = 000040 G         1517#
IECLR = 000020           1566#  3382   4502   4508
IEO   = 000100           1573#  3383   4429   4644   4733
IER   = 020000 G         1525#
ICSET = 000100           1563#  3300   3382   4541   4546   4550   4565   4570   4585   4590   4646
INFACE  002262           1709#  2517   4198*  4201*  4539
INFLAG  002354           1772#  3287*  3309   4520   4593*  4634
INISR   022064 G         4139   4345#
INRCV   002326           1756#  3283*  3470*  3474*  3480   4450*  4553   4557
INTER = 000015           1625#  2525   4369   4533   4541
INXMIT  002330           1757#  3284*  3471*  3475*  3479   4458*  4573   4577
ISP13 = 000076           1649#  5586   5622   5729
ISP7  = 000072           1648#  5324   5385   5918   6011
ISR   = 000100 G         1518#
IXE   = 004000 G         1523#
I$AU  = 000041           1231#
I$AUTO= 000041           1231#  4273#  4307#
I$CLN = 000041           1231#  4323#  4333#
I$DU  = 000041           1231#  4763#  4778#
I$HRD = 000041           8272#  8295#
I$INIT= 000041           1231#  4018#  4235#
I$MOD = 000041           1231#  1234#  8434#
I$MSG = 000041           1231#  3432#  3497#  3500#  3530#  3532#  3593#  3596#  3674#  3678#  3703#  3705#  3731#
                         3734#  3746#  3748#  3760#  3762#  3776#  5423#  5483#  5718#  5793#  6232#  6245#  6496#
                         6510#
I$PROT= 000040           1231#  3998#
I$PTAB= 000041           1231#
I$PWR = 000041           1231#
I$RPT = 000041           1231#
I$SEG = 000041           1231#  4804   4920   4922   4967   5098   5229   5296   5298   5358   5544   5546   5636
                         5860   5862   5931   5974   6024   6106   6109   6178   6280   6282   6390   6528   6530
                         6599   6679   6779   6914   7017   7019   7078   7131   7182   7257   7334   7550   7946
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                    8052    8109    8166    8227
I$SETU= 000041      1231#
I$SFT = 000041      8394#   8407#
I$SPV = 000041      1231#   4345#   4602#   4607#   4741#   4746#   4753#   4849#   4873#
I$SUB = 000041      1231#   4804    4920    4922#   4962#   4964#   4967#   5094#   5096#   5098#   5146#   5148#   5229
                    5296    5298#   5354#   5356#   5358#   5415#   5417#   5544    5546#   5632#   5634#   5636#   5711#
                    5713#   5860    5862#   5927#   5929#   5931#   5970#   5972#   5974#   6020#   6022#   6024#   6061#
                    6063#   6106    6109#   6174#   6176#   6178#   6221#   6223#   6280    6282#   6386#   6388#   6390#
                    6488#   6490#   6528    6530#   6595#   6597#   6599#   6675#   6677#   6679#   6757#   6759#   6779
                    6914    7017    7019#   7074#   7076#   7078#   7127#   7129#   7131#   7178#   7180#   7182#   7253#
                    7255#   7257#   7317#   7319#   7334    7550    7946    8052    8109    8166    8227
I$TST = 000041      1231#   4804#   4844#   4846#   4920#   4922    4967    5098    5150#   5152#   5229#   5236    5255
                    5271#   5273#   5296#   5298    5306    5318    5358    5366    5379    5419#   5421#   5544#   5546
                    5554    5566    5577    5584    5613    5620    5636    5644    5656    5667    5684    5691    5714#
                    5716#   5860#   5862    5870    5881    5890    5916    5931    5948    5974    5982    5993    6002
                    6009    6024    6033    6047    6053    6067#   6069#   6106#   6109    6117    6128    6140    6150
                    6167    6178    6190    6199    6225#   6227#   6280#   6282    6290    6301    6310    6327    6345
                    6377    6390    6398    6409    6418    6435    6451    6491#   6493#   6528#   6530    6538    6549
                    6556    6599    6607    6618    6627    6679    6687    6698    6707    6718    6761#   6763#   6779#
                    6786    6810    6821    6830    6851    6859    6903#   6905#   6914#   6921    6932    6941    6968
                    6998#   7000#   7017#   7019    7052    7078    7105    7131    7156    7182    7190    7201    7212
                    7231    7257    7265    7276    7295    7321#   7323#   7334#   7352    7366    7371    7380    7392
                    7404    7533#   7535#   7550#   7661    7676    7681    7690    7710    7718    7727    7903#   7905#
                    7946#   7963    7977    7984    8001#   8003#   8052#   8068    8082#   8084#   8109#   8124    8139#
                    8141#   8166#   8182    8201#   8203#   8227#   8242    8257#   8259#
J$JMP - 000167       1231#
LAST    002364      1783#   4494*   4516    4531    4533    4535
LF    = 000012      1663#   8302    8306    8312    8330    8336    8340    8355    8371    8375    8408
LLOOP = 000006      1660#   3018    4394
LOCATE  024042 G    4808    4849#
LOCRC   002402      1796#   4977*   5009*   5015    5016*   5017*   5039*   5040    5055
LOE   = 040000 G    1526#
LOGDEV  002370      1786#   4067*   4071*   4072    4075    4298    4768    4833    4931
LOT   = 000010 G    1515#
LOWORD  002406      1798#   4991*   4995*   5010*   5040    5054
LPLU  = 004000      1557#   4439    4442    5560    5599    5650    5875    5936    5987    6037    6040    6122    6295
                    6403    6543    6612    6692    6791    6926    7030    7041    7195    7270    7356    7359    7666
                    7669    7971
L$ACP   002110 G    1340#
L$APT   002036 G    1298#
L$AUT   002070 G    1324#
L$AUTO  021756 G    1341    4273#
L$CCP   002106 G    1338#
L$CLEA  022046 G    1339    4323#
L$CO    002032 G    1294#
L$DEPO  002011 G    1276#
L$DESC  010246 G    1331    1891#
L$DESP  002076 G    1330#
L$DEVP  002060 G    1316#
L$DISP  002124 G    1301    1371#
L$DLY   002116 G    1346#   2197    2320    2424    3317
L$DTP   002040 G    1300#
L$DTYP  002034 G    1296#
L$DU    023640 G    1327    4763#
L$DUT   002072 G    1326#
L$DVTY  010240 G    1317    1883#
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L$EF    002052 G        1311#
L$ENVI  002044 G        1304#
L$ETP   002102 G        1334#
L$EXP1  002046 G        1306#
L$EXP4  002064 G        1320#
L$EXP5  002066 G        1322#
L$HARD  036744 G        1283    8272    8273#
L$HIME  002120 G        1348#   3089    7575    7838
L$HPCP  002016 G        1282#
L$HPTP  002022 G        1286#
L$HW    002174 G        1287    1407    1408#
L$ICP   002104 G        1336#
L$INIT  020452 G        1337    4018#
L$LADP  002026 G        1290#
L$LAST  040100 G        1291    8439#
L$LOAD  002100 G        1332#
L$LUN   002074 G        1328#
L$MREV  002050 G        1308#
L$NAME  002000 G        1265#
L$PRIO  002042 G        1302#
L$PROT  020444 G        1343    3998#
L$PRT   002112 G        1342#
L$REPP  002062 G        1318#
L$REV   002010 G        1274#
L$SOFT  037700 G        1285    8394    8395#
L$SPC   002056 G        1314#
L$SPCP  002020 G        1284#
L$SPTP  002024 G        1288#
L$STA   002030 G        1292#
L$SW    002224 G        1289    1439    1440#
L$TEST  002114 G        1344#   2849    2851    3384
L$TIML  002014 G        1280#
L$UNIT  002012 G        1278#   4072
L10000  002222          1407    1424#
L10001  002226          1439    1446#
L10002  015122          3495#
L10003  015236          3528#
L10004  015466          3591#
L10005  015762          3672#
L 0006  016060          3701#
L10007  016162          3729#
L10010  016214          3744#
L10011  016246          3758#
L10012  016300          3774#
L10014  021510          4233#
L10015  022044          4305#
L10016  022062          4331#
L10017  023140          4600#
L10020  023626          4739#
L10021  023636          4751#
L10022  023666          4776#
L10023  024040          4844#
L10024  024116          4871#
L10025  025202          5150#
L10026  024404          4962#
L10027  025026          5094#
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L10030  025200          5146#
L10031  025644          5237    5256    5271#
L10032  026152          5307    5319    5367    5380    5419#
L10033  026022          5354#
L10034  026150          5415#
L10035  026372          5481#
L10036  027264          5555    5567    5578    5585    5614    5621    5645    5657    5668    5685    5692    5714#
L10037  027104          5632#
L10040  027262          5711#
L10041  027572          5791#
L10042  030552          5871    5882    5891    5917    5949    5983    5994    6003    6010    6034    6048    6054    6067#
L10043  030270          5927#
L10044  030360          5970#
L10045  030454          6020#
L10046  030550          6061#
L10047  031160          6118    6129    6141    6151    6168    6191    6200    6225#
L10050  031060          6174#
L10051  031156          6221#
L10052  031224          6243#
L10053  031766          6291    6302    6311    6328    6346    6378    6399    6410    6419    6436    6452    6491#
L10054  031560          6386#
L10055  031764          6488#
L10056  032024          6508#
L10057  032552          6539    6550    6557    6608    6619    6628    6688    6699    6708    6719    6761#
L10060  032204          6595#
L10061  032364          6675#
L10062  032550          6757#
L10063  032776          6787    6811    6822    6831    6852    6860    6903#
L10064  033156          6922    6933    6942    6969    6998#
L10065  034062          7053    7106    7157    7191    7202    7213    7232    7266    7277    7296    7321#
L10066  033306          7074#
L10067  033424          7127#
L10070  033542          7178#
L10071  033720          7253#
L10072  034060          7317#
L10073  034612          7353    7367    7372    7381    7393    7405    7533#
L10074  036236          7662    7677    7682    7691    7711    7719    7728    7903#
L10075  036460          7964    7978    7985    8001#
L10076  036546          8069    8082#
L10077  036616          8125    8139#
L10100  036666          8183    8201#
L10101  036740          8243    8257#
L10102  036776          8272    8294#
L10103  037712          8394    8406#
MAINT  = 000400         1586#   2595    4409    5998    6306
MAINT1= 000010          1596#   3021    3026    4397    4400
MAINT2= 000004          1599#   3020    3027    4396    4401
MANUF   002310          1735#   4205
MCLR   = 040000         1554#   2398    2401    4327    4641
MDIAG  = 020000         1555#   2401
MICRO   002256          1699#
MMANAG  002302          1721#   3092*   3159*   3340    3349    3368    3378    4462    4657
MNTMDE  002300          1720#   4407    7953*   8058*   8114*   8172*   8232*
MNTREC= 000010          1597#
MODEM   031162          6132    6228#
N      = 000043         1639#   5338    5399    5435
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NAKS   = 000001          1601#
NESTPC   002376          1789#  2170   2243   2299   2335   2484*  2540*  2582*  2641*  2697   2706   2707*  2714*
                         2740   2783*  2804*  2832   2868   2902*  2941*  3029*  3036*  3282*  3413*
NEWST    020612          4055   4066#  4073
NEXT     022620          4352   4515#
NOBFR  = 000004          1598#  6361   6462
NOXMEM   023630 G        3079   4277   4746#  7555   7608   7860
NXM    = 000400          1590#  6584   6663   6746
NXMFLG   002352          1770#  3076*  3085   3126   3135   3255*  4030*  4282*  4295   4302*  4325   4748*  4813*
                         4830   4837*  4851   4859*  7560*  7565   7569*  7605*  7620   7630   7639   7857*  7868
                         7877
OUTFLG   002356          1775#  3288*  3311   4522   4636   4734*
OUTISR   023142 G        4146   4607#
OUTRCV   002332          1758#  3285*  3472*  3476*  3488   4714*  4730
OUTXMT   002334          1759#  3286*  3473*  3477*  3487   4694*  4728
O$APTS=  000000          1231#  1292
O$AU   = 000000          1231#  1324
O$BGNR=  000000          1231#  1318
O$BGNS=  000001          1231#  1250#  1284
O$DU   = 000001          1231#  1250#  1326
O$ERRT=  000000          1231#  1334
O$GNSW=  000001          1231#  1250#  1288
O$POIN=  000001          1231#  1250#  1350
O$SETU=  000000          1231#  1278   8437
PATCH    040042          8427#
PNT    = 001000 G        1521#
PRETIM=  000055          1643#  5693   5735   5739
PRI    = 002000 G        1522#
PRI00  = 000000 G        1510#
PRI01  = 000040 G        1509#
PRI02  = 000100 G        1508#
PRI03  = 000140 G        1507#
PRI04  = 000200 G        1506#  3296
PRI05  = 000240 G        1505#  4138   4145
PRI06  = 000300 G        1504#
PRI07  = 000340 G        1503#  3078   3094   3411   4021   4276   4807   7554   7580   7607   7859
PSTACK   002372          1787#  4023*
P1       036776          8277   8296#
P2       037014          8282   8299#
P3       037035          8287   8302#
R      - 000042          1638#  5336   5397   5424   5428
RBUF     002572          1850#  6713   6947   7146   7207   7285   7338   7387   7470   7490
RCOUNT=  000044          1849#  6638   6714   6948   7147   7208   7335   7388   7479   7488
RCV    = 000004          1569#  4692   7424   7516   7739   7825
RCVBUF   003640          1864#  3142*  3179*  3180*  3215   3223   3224   3291   3293   3337
RDI    - 000200          1562#  2187   2311   4350
RDO    = 000200          1572#  2185   2522   2639   2940   4609   4736   6349   6370   6379   6592   6672   6754
                         7071   7124   7175   7250   7314   7516   7825
RES    = 010000          1578#  2510   4432   5601   5938   6567
RESFLG   002360          1777#  4433*  4559   4568*  4579   4588*
RESUME   002274          1718#  4026*  4518   4555   4575   4639   7951*  8056*  8112*  8170*  8230*
RETURN-  000207          1654#
REV1     025540          4939*  4945   5195#
REV2     025542          4940*  4943   5196#
RFLAG    002570          1848#  7345*  7460   7469*  7517   7694*  7769   7778*  7826   7841*
RLOOP  = 000007          1661#
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RMODEM= 000017          1626#   5893    5950    6143    6192
ROMADR  002412          1800#   2967    2976    4929*   4957*   4974*   4993*   4999*   5102*   5142*
ROMI   = 001000          1559#   2968    2974    2977    2983
ROMLOC  025531          5129    5192#
ROMO   = 002000          1558#   2984
RQI    = 000040          1565#   2298    2483    2525    2581    2705    2900    3300    4503    4541    4546    4550    4565
                        4570    4585    4590    4646    5893    5950    6143    6192    6334    6440    6636    6644    6712
                        6727    6845    6946    6957    7145    7206    7220    7284    7386    7398    7706    7714
RRAM   = 000014          1624#
RSEL4   035362          7698*   7707#   7779    7848*
RSEL6   035364          7699*   7708#   7788    7849*
RUN    = 100000          1553#   2415    3551
SAVE    002342          1765#   2702*   2720    2744*
SECN   = 004000          1581#
SEL0   = 002232          1684#   2187    2298*   2311    2398*   2401*   2415    2495*   2522    2705*   2900*   2966*   2968*
                        2973*   2974*   2977*   2981*   2983*   2984*   3382*   3442    3513    3545    3551    4327*   4348
                        4350    4439*   4442*   4502*   4503*   4508*   4641*   4646*   4823    5721    5893*   5950*   6143*
                        6192*
SEL2    002234          1681#   1687    2185    2224    2621    2639*   2901*   2923    2940*   2967*   3383*   3441    3512
                        3544    4097*   4098*   4429*   4609    4619    4644*   4692    4733*   4736*   4825    5720    6349*
                        6352    6370*   6379*   6453    6575    6592*   6654    6672*   6737    6754*   6879    6970    7054
                        7071*   7107    7124*   7158    7175*   7233    7250*   7297    7314*   7415    7424    7516*   7730
                        7739    7825*
SEL4    002236          1682#   1689    2497*   2722*   2794*   3450    3521    3687    3714    4101*   4102*   4418*   4451*
                        4459*   4468    4469*   4476*   4482*   4486*   4671    4673*   4677*   4682*   4687*   4690*   4695
                        4715    4827    5899    5956    7439    7470    7751    7779
SEL6    002240          1683#   1691    2499*   2510    2593*   2595    2630    2725*   2730*   2732*   2796*   2932    2969*
                        2978*   3449    3520    3686    3713    4105*   4106*   4396*   4397*   4400*   4401*   4409*   4412*
                        4422*   4425*   4432*   4452*   4460*   4465*   4621    4623    4659    4670*   4705    4725    4829
                        6361    6462    6584    6663    6746    6888    6979    7063    7116    7167    7242    7306    7448
                        7479    7760    7788
SFLAG   002346          1767#   7695*   7796    7834    7?37*
SFPTBL  002224  G       1441#
SKIP    002350          1768#
SPEED   002224          1443#   4156
STARES  002270          1713#   4064*   4069*   4217    4924
STARST  020606          4045    4050    4063#
START   002272          1717#   3289*   4427    4527    4549*
STLU   = 010000          1556#
STREC  = 000200          1591#
STUP   = 000400          1560#   2973    2974    2981    2983
SUBRPC  002374          1788#   2172*   2173*   2245*   2301*   2302*   2337*   2384*   2385*   2440*   2480*   2481*   2541*
                        2579*   2580*   2642*   2699*   2700*   2742*   2779*   2780*   2805*   2834*   2835*   2870*   2898*
                        2899*   2942*   3016*   3017*   3037*   3074*   3075*   3256*   3280*   3281*   3414*   3434    3501
                        3504    3533    3536    3597    3600    4024*
SVCGBL= 000000          1231#   1241#   1265    1274    1276    1278    1280    1282    1284    1286    1288    1290    1292
                        1294    1296    1298    1300    1302    1304    1306    1308    1311    1314    1316    1318    1320
                        1322    1324    1326    1328    1330    1332    1334    1336    1338    1340    1342    1344    1346
                        1348    1371    1408    1409    1440    1441    1883    1891    3432    3500    3532    3596    3678
                        3705    3734    3748    3762    3998    4018    4273    4323    4345    4607    4746    4763    4849
                        5423    5718    6232    6496    8273    8395    8439#   8440
SVCINS= 000001          1231#   1238#   1266    1267    1268    1269    1270    1271    1272    1273    1275    1277    1279
                        1281    1283    1285    1287    1289    1291    1293    1295    1297    1299    1301    1303    1305
                        1307    1309    1310    1312    1313    1315    1317    1319    1321    1323    1325    1327    1329
                        1331    1333    1335    1337    1339    1341    1343    1345    1347    1349    1370    1372    1373
                        1374    1375    1376    1377    1378    1379    1380    1381    1382    1383    1384    1385    1386
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CROSS REFERENCE TABLE -- USER SYMBOLS

1387	1388	1389	1390	1407	1439	1884	1885	1892	1896	2190	2195	2196
2197	2198	2199	2200	2201	2202	2207	2208	2209	2210	2219	2220	2221
2222	2223	2227	2228	2229	2230	2237	2238	2239	2240	2241	2314	2318
2319	2320	2321	2322	2323	2324	2325	2329	2330	2331	2332	2418	2422
2423	2424	2425	2426	2427	2428	2429	2433	2434	2435	2436	2491	2507
2532	2589	2612	2614	2615	2616	2617	2618	2624	2625	2626	2627	2633
2634	2635	2636	2716	2790	2863	2864	2865	2866	2909	2915	2922	2926
2927	2928	2929	2935	2936	2937	2938	3078	3079	3080	3081	3082	3083
3094	3095	3161	3162	3164	3165	3296	3297	3305	3315	3316	3317	3318
3319	3320	3321	3322	3328	3329	3330	3331	3354	3355	3356	3357	3373
3374	3375	3376	3411	3412	3434	3435	3436	3437	3438	3439	3441	3442
3443	3444	3445	3446	3447	3449	3450	3451	3452	3453	3454	3455	3457
3458	3459	3460	3461	3462	3464	3465	3466	3467	3468	3469	3479	3480
3481	3482	3483	3484	3485	3487	3488	3489	3490	3491	3492	3493	3496
3504	3505	3506	3507	3508	3509	3512	3513	3514	3515	3516	3517	3518
3520	3521	3522	3523	3524	3525	3526	3529	3536	3537	3538	3539	3540
3541	3544	3545	3546	3547	3548	3549	3550	3556	3557	3558	3559	3560
3566	3567	3568	3569	3570	3574	3575	3576	3577	3578	3584	3585	3586
3587	3588	3592	3600	3601	3602	3603	3604	3605	3613	3614	3615	3616
3617	3618	3619	3620	3621	3629	3630	3631	3632	3633	3634	3635	3636
3637	3645	3646	3647	3648	3649	3650	3651	3652	3653	3661	3662	3663
3664	3665	3666	3667	3668	3669	3673	3680	3681	3682	3683	3684	3686
3687	3688	3689	3690	3691	3692	3694	3695	3696	3697	3698	3699	3702
3707	3708	3709	3710	3711	3713	3714	3715	3716	3717	3718	3719	3721
3722	3723	3724	3725	3726	3727	3730	3736	3737	3738	3739	3740	3741
3742	3745	3750	3751	3752	3753	3754	3755	3756	3759	3766	3767	3768
3769	3770	3771	3772	3775	4021	4022	4038	4039	4042	4043	4045	4047
4048	4050	4052	4053	4055	4057	4058	4060	4075	4076	4077	4079	4086
4087	4088	4089	4090	4091	4092	4114	4115	4116	4117	4118	4119	4120
4138	4139	4140	4141	4142	4143	4145	4146	4147	4148	4149	4150	4220
4221	4222	4223	4224	4234	4276	4277	4278	4279	4280	4281	4293	4294
4298	4299	4301	4306	4332	4374	4375	4376	4377	4601	4613	4614	4615
4616	4628	4629	4630	4631	4651	4652	4653	4654	4664	4665	4666	4667
4699	4700	4701	4702	4708	4709	4710	4711	4718	4719	4720	4721	4740
4752	4766	4768	4769	4770	4771	4772	4773	4777	4807	4808	4809	4810
4811	4812	4833	4834	4836	4840	4841	4845	4855	4856	4857	4858	4862
4863	4864	4865	4866	4867	4868	4872	4923	4931	4932	4933	4934	4935
4936	4943	4944	4945	4946	4947	4948	4949	4950	4951	4963	4968	5048
5049	5050	5051	5054	5055	5056	5057	5058	5059	5060	5061	5072	5073
5074	5075	5078	5079	5080	5081	5082	5083	5084	5085	5095	5099	5120
5121	5122	5123	5126	5127	5128	5129	5130	5131	5132	5133	5134	5147
5151	5236	5237	5241	5242	5243	5244	5245	5255	5256	5265	5266	5267
5268	5272	5299	5306	5307	5318	5319	5329	5330	5331	5332	5348	5349
5350	5351	5355	5359	5366	5367	5379	5380	5390	5391	5392	5393	5409
5410	5411	5412	5416	5420	5427	5428	5429	5430	5431	5432	5433	5438
5439	5440	5441	5442	5443	5444	5450	5451	5452	5453	5454	5455	5456
5461	5462	5463	5464	5465	5466	5467	5472	5473	5474	5475	5476	5477
5478	5482	5547	5554	5555	5566	5567	5577	5578	5584	5585	5590	5591
5592	5593	5613	5614	5620	5621	5626	5627	5628	5629	5633	5637	5644
5645	5656	5657	5667	5668	5684	5685	5691	5692	5705	5706	5707	5708
5712	5715	5720	5721	5722	5723	5724	5725	5726	5728	5729	5730	5731
5732	5733	5734	5738	5739	5740	5741	5742	5743	5744	5749	5750	5751
5752	5753	5754	5755	5760	5761	5762	5763	5764	5765	5766	5771	5772
5773	5774	5775	5776	5777	5782	5783	5784	5785	5786	5787	5788	5792
5863	5870	5871	5881	5882	5890	5891	5902	5903	5904	5905	5916	5917
5921	5922	5923	5924	5928	5932	5948	5949	5959	5960	5961	5962	5971

5975 5982 5983 5993 5994 6002 6003 6009 6010 6014 6015 6016 6017
6021 6025 6033 6034 6047 6048 6053 6054 6062 6068 6110 6117 6118
6128 6129 6140 6141 6150 6151 6157 6158 6159 6160 6167 6168 6175
6179 6190 6191 6199 6200 6206 6207 6208 6209 6222 6226 6234 6235
6236 6237 6238 6239 6240 6241 6244 6283 6290 6291 6301 6302 6310
6311 6327 6328 6345 6346 6355 6356 6357 6358 6364 6365 6366 6367
6377 6378 6387 6391 6398 6399 6409 6410 6418 6419 6435 6436 6451
6452 6456 6457 6458 6459 6465 6466 6467 6468 6481 6482 6483 6484
6489 6492 6498 6499 6500 6501 6502 6503 6504 6505 6506 6509 6531
6538 6539 6549 6550 6556 6557 6578 6579 6580 6581 6587 6588 6589
6590 6596 6600 6607 6608 6618 6619 6627 6628 6657 6658 6659 6660
6666 6667 6668 6669 6676 6680 6687 6688 6698 6699 6707 6708 6718
6719 6740 6741 6742 6743 6749 6750 6751 6752 6758 6762 6786 6787
6810 6811 6821 6822 6830 6831 6851 6852 6859 6860 6867 6868 6869
6870 6882 6883 6884 6885 6891 6892 6893 6894 6904 6921 6922 6932
6933 6941 6942 6968 6969 6973 6974 6975 6976 6983 6984 6985 6986
6999 7020 7052 7053 7057 7058 7059 7060 7066 7067 7068 7069 7075
7079 7105 7106 7110 7111 7112 7113 7119 7120 7121 7122 7128 7132
7156 7157 7161 7162 7163 7164 7170 7171 7172 7173 7179 7183 7190
7191 7201 7202 7212 7213 7231 7232 7236 7237 7238 7239 7245 7246
7247 7248 7254 7258 7265 7266 7276 7277 7295 7296 7300 7301 7302
7303 7309 7310 7311 7312 7318 7322 7352 7353 7366 7367 7371 7372
7380 7381 7392 7393 7404 7405 7414 7418 7419 7420 7421 7432 7433
7434 7435 7442 7443 7444 7445 7451 7452 7453 7454 7463 7464 7465
7466 7473 7474 7475 7476 7482 7483 7484 7485 7500 7501 7502 7503
7507 7508 7509 7510 7534 7554 7555 7556 7557 7558 7559 7563 7564
7580 7581 7607 7608 7609 7610 7611 7612 7637 7638 7642 7643 7644
7645 7647 7648 7649 7650 7651 7652 7661 7662 7676 7677 7681 7682
7690 7691 7710 7711 7718 7719 7727 7728 7733 7734 7735 7736 7744
7745 7746 7747 7754 7755 7756 7757 7763 7764 7765 7766 7772 7773
7774 7775 7782 7783 7784 7785 7791 7792 7793 7794 7818 7819 7820
7821 7859 7860 7861 7862 7863 7864 7875 7876 7882 7883 7884 7885
7887 7888 7889 7890 7891 7892 7904 7963 7964 7977 7978 7984 7985
8002 8068 8069 8083 8124 8125 8140 8182 8183 8202 8242 8243 8258
8272 8276 8277 8278 8279 8281 8282 8283 8284 8286 8287 8288 8289
8290 8293 8394 8398 8399 8400 8401 8402 8405 8436 8437 8438

SVCSUB= 000001 1231# 1240# 4922 4967 5098 5298 5358 5546 5636 5862 5931 5974 6024
6109 6178 6282 6390 6530 6599 6679 7019 7078 7131 7182 7257

SVCTAG= 000001 1231# 1242# 1424 1446 3495 3528 3591 3672 3701 3729 3744 3758 3774
4233 4305 4331 4600 4739 4751 4776 4844 4871 4962 5094 5146 5150
5271 5354 5415 5419 5481 5632 5711 5714 5791 5927 5970 6020 6061
6067 6174 6221 6225 6243 6386 6488 6491 6508 6595 6675 6757 6761
6903 6998 7074 7127 7178 7253 7317 7321 7533 7903 8001 8082 8139
8201 8257 8294 8406

SVCTST= 000001 1231# 1239# 4804 4920 5229 5296 5544 5860 6106 6280 6528 6779 6914
7017 7334 7550 7946 8052 8109 8166 8227

SW00 = 000001 1548#
SW01 = 000002 1547#
SW02 = 000004 1546#
SW03 = 000010 1545#
SW04 = 000020 1544#
SW05 = 000040 1543#
SW06 = 000100 1542#
SW07 = 000200 1541#
SW08 = 000400 1540#
SW09 = 001000 1539#

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SW10   = 002000            1538#
SW11   = 004000            1537#
SW12   = 010000            1536#
SW13   = 020000            1535#
SW14   = 040000            1534#
SW15   = 100000            1533#
S$LSYM= 010000             1231#  1425#  1447#  3496#  3529#  3592#  3673#  3702#  3730#  3745#  3759#  3775#  4234#
                           4306#  4332#  4601#  4740#  4752#  4777#  4845#  4872#  4963#  5095#  5147#  5151#  5272#
                           5355#  5416#  5420#  5482#  5633#  5712#  5715#  5792#  5928#  5971#  6021#  6062#  6068#
                           6175#  6222#  6226#  6244#  6387#  6489#  6492#  6509#  6596#  6676#  6758#  6762#  6904#
                           6999#  7075#  7128#  7179#  7254#  7318#  7322#  7534#  7904#  8002#  8083#  8140#  8202#
                           8258#  8295#  8407#
S1       037712            8399   8408#
T      = 000045            1641#  5342   5403   5458   5462
TBUF     002522            1835#  6335   6441   6645   6846   6958   7221   7399   7439   7489
TCOUNT= 000044             1834#  6336   6442   6646   6847   6959   7400   7448
TEMP     002340            1764#  2175*  2214   2234
TEMP1    002336            1763#  8053*  8080
TFLAG    002520            1833#  7344*  7429   7438*  7521   7693*  7741   7750*  7830   7840*
THRESH= 000013             1619#  5678   6321   6429   6804
TH1L   = 000060            1644#  5697   5746   5750
TH2L   = 000062            1645#  5699   5757   5761
TH3L   = 000064            1646#  5695   5768   5772
TH4L   = 000066            1647#  5701   5779   5783
TIMER  = 000012            1618#  5661   6815
TOLONG= 000020             1595#  6979
TOUT   = 000002            1600#  6888
TSEL4    035400            7701*  7715#  7751   7851*
TSEL6    035402            7702*  7716#  7760   7852*
T$ARGC= 000002             1266#  1267#  1268#  1269#  1270#  1271#  2219#  2223   2237#  2241   2614#  2618   3434#
                           3439   3441#  3447   3449#  3455   3457#  3462   3464#  3469   3479#  3485   3487#  3493
                           3504#  3509   3512#  3518   3520#  3526   3536#  3541   3544#  3550   3556#  3560   3566#
                           3570   3574#  3578   3584#  3588   3600#  3605   3613#  3621   3629#  3637   3645#  3653
                           3661#  3669   3680#  3684   3686#  3692   3694#  3699   3707#  3711   3713#  3719   3721#
                           3727   3736#  3742   3750#  3756   3766#  3772   4086#  4092   4114#  4120   4220#  4224
                           4768#  4773   4862#  4868   4931#  4936   4943#  4951   5054#  5061   5078#  5085   5126#
                           5134   5241#  5245   5427#  5433   5438#  5444   5450#  5456   5461#  5467   5472#  5478
                           5720#  5726   5728#  5734   5738#  5744   5749#  5755   5760#  5766   5771#  5777   5782#
                           5788   6234#  6241   6498#  6506   7647#  7652   7887#  7892
T$CODE= 000032             8276#  8281#  8286#  8398#
T$ERRN= 000023             1231#  2208#  2228#  2330#  2434#  2625#  2634#  2864#  2927#  2936#  3329#  3355#  3374#
                           4375#  4613#  4629#  4652#  4665#  4700#  4706#  4719#  4856#  5049#  5073#  5121#  5266#
                           5330#  5349#  5391#  5410#  5591#  5627#  5706#  5903#  5922#  5960#  6015#  6158#  6207#
                           6356#  6365#  6457#  6466#  6482#  6579#  6588#  6658#  6667#  6741#  6750#  6868#  6883#
                           6892#  6974#  6984#  7058#  7067#  7111#  7120#  7162#  7171#  7237#  7246#  7301#  7310#
                           7419#  7433#  7443#  7452#  7464#  7474#  7483#  7501#  7508#  7643#  7734#  7745#  7755#
                           7764#  7773#  7783#  7792#  7819#  7883#
T$EXCP= 000000             8276#  8280   8281#  8285   8286#  8291   8398#  8403
T$FLAG= 000040             5236#  5255#  5306#  5318#  5366#  5379#  5554#  5566#  5577#  5584#  5613#  5620#  5644#
                           5656#  5667#  5684#  5691#  5870#  5881#  5890#  5916#  5948#  5982#  5993#  6002#  6009#
                           6033#  6047#  6053#  6117#  6128#  6140#  6150#  6167#  6190#  6199#  6290#  6301#  6310#
                           6327#  6345#  6377#  6398#  6409#  6418#  6435#  6451#  6538#  6549#  6556#  6607#  6618#
                           6627#  6687#  6698#  6707#  6718#  6786#  6810#  6821#  6830#  6851#  6859#  6921#  6932#
                           6941#  6968#  7052#  7105#  7156#  7190#  7201#  7212#  7231#  7265#  7276#  7295#  7352#
                           7366#  7371#  7380#  7392#  7404#  7661#  7676#  7681#  7690#  7710#  7718#  7727#  7963#
                           7977#  7984#  8068#  8124#  8182#  8242#
```

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T$GMAN= 000000  1231#
T$HILI= 000005  8276#  8279   8281#  8284   8286#  8290   8398#  8402
T$LAST= 000001  1231#  8437#
T$LOLI= 000001  8276#  8278   8281#  8283   8286#  8289   8398#  8401
T$LSYM= 010000  1231#  1425   1447   3496   3529   3592   3673   3702   3730   3745   3759   3775   4234
                4306   4332   4601   4740   4752   4777   4845   4872   4963   5095   5147   5151   5272
                5355   5416   5420   5482   5633   5712   5715   5792   5928   5971   6021   6062   6068
                6175   6222   6226   6244   6387   6489   6492   6509   6596   6676   6758   6762   6904
                6999   7075   7128   7179   7254   7318   7322   7534   7904   8002   8083   8140   8202
                8258   8295   8407
T$LTNO= 000023  8440#
T$NEST= 177777  1231#  1234#  1407#  1424#  1439#  1446#  3432#  3495#  3500#  3528#  3532#  3591#  3596#
                3672#  3678#  3701#  3705#  3729#  3734#  3744#  3748#  3758#  3762#  3774#  3998#  4005#
                4018#  4233#  4273#  4305#  4323#  4331#  4345#  4600#  4607#  4739#  4746#  4751#  4763#
                4776#  4805#  4844#  4849#  4871#  4921#  4923#  4962#  4968#  5094#  5099#  5146#  5150#
                5230#  5271#  5297#  5299#  5354#  5359#  5415#  5419#  5423#  5481#  5545#  5547#  5632#
                5637#  5711#  5714#  5718#  5791#  5861#  5863#  5927#  5932#  5970#  5975#  6020#  6025#
                6061#  6067#  6107#  6110#  6174#  6179#  6221#  6225#  6232#  6243#  6281#  6283#  6386#
                6391#  6488#  6491#  6496#  6508#  6529#  6531#  6595#  6600#  6675#  6680#  6757#  6761#
                6780#  6903#  6915#  6998#  7018#  7020#  7074#  7079#  7127#  7132#  7178#  7183#  7253#
                7258#  7317#  7321#  7335#  7533#  7551#  7903#  7947#  8001#  8053#  8082#  8110#  8139#
                8167#  8201#  8228#  8257#  8272#  8293#  8394#  8405#  8434#
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T$NS1 = 000005  1407#  1424   1439#  1446   3432#  3495   3500#  3528   3532#  3591   3596#  3672   3678#
                3701   3705#  3729   3734#  3744   3748#  3758   3762#  3774   3998#  4005   4018#  4233
                4273#  4305   4323#  4331   4345#  4600   4607#  4739   4746#  4751   4763#  4776   4805#
                4844   4849#  4871   4921#  5150   5230#  5271   5297#  5419   5423#  5481   5545#  5714
                5718#  5791   5861#  6067   6107#  6225   6232#  6243   6281#  6491   6496#  6508   6529#
                6761   6780#  6903   6915#  6998   7018#  7321   7335#  7533   7551#  7903   7947#  8001
                8053#  8082   8110#  8139   8167#  8201   8228#  8257   8272#  8293   8394#  8405
T$NS2 - 000002  4923#  4962   4968#  5094   5099#  5146   5299#  5354   5359#  5415   5547#  5632   5637#
                5711   5863#  5927   5932#  5970   5975#  6020   6025#  6061   6110#  6174   6179#  6221
                6283#  6386   6391#  6488   6531#  6595   6600#  6675   6680#  6757   7020#  7074   7079#
                7127   7132#  7178   7183#  7253   7258#  7317
T$PTNU- 000000  1231#
T$SAVL- 177777  1231#
T$SEGL- 177777  1231#
T$SUBN= 000000  1231#  4804#  4920#  4922#  4967#  5098#  5229#  5296#  5298#  5358#  5544#  5546#  5636#
                5860#  5862#  5931#  5974#  6024#  6106#  6109#  6178#  6280#  6282#  6390#  6528#  6530#
                6599#  6679#  6779#  6914#  7017#  7019#  7078#  7131#  7182#  7257#  7334#  7550#  7946#
                8052#  8109#  8166#  8227#
T$TAGL= 177777  1231#
T$TAGN= 010104  1231#  1407#  1439#  3432#  3500#  3532#  3596#  3678#  3705#  3734#  3748#  3762#  3998#
                4018#  4273#  4323#  4345#  4607#  4746#  4763#  4805#  4849#  4921#  4923#  4968#  5099#
                5230#  5297#  5299#  5359#  5423#  5545#  5547#  5637#  5718#  5861#  5863#  5932#  5975#
                6025#  6107#  6110#  6179#  6232#  6281#  6283#  6391#  6496#  6529#  6531#  6600#  6680#
                6780#  6915#  7018#  7020#  7079#  7132#  7183#  7258#  7335#  7551#  7947#  8053#  8110#
                8167#  8228#  8272#  8394#
T$TEMP- 000000  1372#  1373#  1374#  1375#  1376#  1377#  1378#  1379#  1380#  1381#  1382#  1383#  1384#
                1385#  1386#  1387#  1388#  1389#  1390#  1391#  1424#  1446#  3495#  3528#  3591#  3672#
                3701#  3729#  3744#  3758#  3774#  4005#  4233#  4305#  4331#  4600#  4739#  4751#  4776#
                4844#  4871#  4962#  5094#  5146#  5150#  5236#  5237   5255#  5256   5271#  5306#  5307
                5318#  5319   5354#  5366#  5367   5379#  5380   5415#  5419#  5481#  5554#  5555   5566#
                5567   5577#  5578   5584#  5585   5613#  5614   5620#  5621   5632#  5644#  5645   5656#
                5657   5667#  5668   5684#  5685   5691#  5692   5711#  5714#  5791#  5870#  5871   5881#
                5882   5890#  5891   5916#  5917   5927#  5948#  5949   5970#  5982#  5983   5993#  5994
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                    6002#  6003   6009#  6010   6020#  6033#  6034   6047#  6048   6053#  6054   6061#  6067#
                    6117#  6118   6128#  6129   6140#  6141   6150#  6151   6167#  6168   6174#  6190#  6191
                    6199#  6200   6221#  6225#  6243#  6290#  6291   6301#  6302   6310#  6311   6327#  6328
                    6345#  6346   6377#  6378   6386#  6398#  6399   6409#  6410   6418#  6419   6435#  6436
                    6451#  6452   6488#  6491#  6508#  6538#  6539   6549#  6550   6556#  6557   6595#  6607#
                    6608   6618#  6619   6627#  6628   6675#  6687#  6688   6698#  6699   6707#  6708   6718#
                    6719   6757#  6761#  6786#  6787   6810#  6811   6821#  6822   6830#  6831   6851#  6852
                    6859#  6860   6903#  6921#  6922   6932#  6933   6941#  6942   6968#  6969   6998#  7052#
                    7053   7074#  7105#  7106   7127#  7156#  7157   7178#  7190#  7191   7201#  7202   7212#
                    7213   7231#  7232   7253#  7265#  7266   7276#  7277   7295#  7296   7317#  7321#  7352#
                    7353   7366#  7367   7371#  7372   7380#  7381   7392#  7393   7404#  7405   7533#  7661#
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                    7903#  7963#  7964   7977#  7978   7984#  7985   8001#  8068#  8069   8082#  8124#  8125
                    8139#  8182#  8183   8201#  8242#  8243   8257#  8276#  8281#  8286#  8293#  8398#  8405#
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                    6599   6679   6779#  6914#  7017#  7019   7078   7131   7182   7257   7334#  7550#  7946#
                    8052#  8109#  8166#  8227#  8440
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                    2863   2926   2935   3082   3095   3162   3164   3297   3305   3328   3354   3373   3412
                    3438   3446   3454   3461   3468   3484   3492   3496   3508   3517   3525   3529   3540
                    3549   3559   3569   3577   3587   3592   3604   3620   3636   3652   3668   3673   3683
                    3691   3698   3702   3710   3718   3726   3730   3741   3745   3755   3759   3771   3775
                    4022   4039   4043   4048   4053   4058   4076   4091   4119   4142   4149   4223   4234
                    4280   4294   4299   4301   4306   4332   4374   4613   4628   4651   4664   4699   4708
                    4718   4766   4772   4777   4811   4834   4836   4841   4845   4855   4867   4923   4935
                    4950   4963   4968   5048   5060   5072   5084   5095   5099   5120   5133   5147   5151
                    5236   5244   5255   5265   5272   5299   5306   5318   5329   5348   5355   5359   5366
                    5379   5390   5409   5416   5420   5432   5443   5455   5466   5477   5482   5547   5554
                    5566   5577   5584   5590   5613   5620   5626   5633   5637   5644   5656   5667   5684
                    5691   5705   5712   5715   5725   5733   5743   5754   5765   5776   5787   5792   5863
                    5870   5881   5890   5902   5916   5921   5928   5932   5948   5959   5971   5975   5982
                    5993   6002   6009   6014   6021   6025   6033   6047   6053   6062   6068   6110   6117
                    6128   6140   6150   6157   6167   6175   6179   6190   6199   6206   6222   6226   6240
                    6244   6283   6290   6301   6310   6327   6345   6355   6364   6377   6387   6391   6398
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                    6549   6556   6578   6587   6596   6600   6607   6618   6627   6657   6666   6676   6680
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                    6859   6867   6882   6891   6904   6921   6932   6941   6968   6973   6983   6999   7020
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                    7179   7183   7190   7201   7212   7231   7236   7245   7254   7258   7265   7276   7295
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                    7451   7463   7473   7482   7500   7507   7534   7558   7564   7581   7611   7638   7642
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                    8083   8124   8140   8182   8202   8242   8258
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                    7335#  7551#  7947#  8053#  8110#  8167#  8228#
T$$AUT= 010015       4273#  4305
T$$CLE= 010016       4323#  4331
T$$DU = 010022       4763#  4776
T$$HAR= 010102       8272#  8294
T$$HW = 010000       1407#  1424
T$$INI= 010014       4018#  4233
T$$MSG= 010056       3432#  3495   3500#  3528   3532#  3591   3596#  3672   3678#  3701   3705#  3729   3734#
```

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                        3744    3748#   3758    3762#   3774    5423#   5481    5718#   5791    6232#   6243    6496#   6508
T$$PRO= 010013          3998#
T$$SOF= 010103          8394#   8406
T$$SRV= 010024          4345#   4600    4607#   4739    4746#   4751    4849#   4871
T$$SUB= 010072          4923#   4962    4968#   5094    5099#   5146    5299#   5354    5359#   5415    5547#   5632    5637#
                        5711    5863#   5927    5932#   5970    5975#   6020    6025#   6061    6110#   6174    6179#   6221
                        6283#   6386    6391#   6488    6531#   6595    6600#   6675    6680#   6757    7020#   7074    7079#
                        7127    7132#   7178    7183#   7253    7258#   7317
T$$SW = 010001          1439#   1446
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                        5419    5545#   5554    5566    5577    5584    5613    5620    5644    5656    5667    5684    5691
                        5714    5861#   5870    5881    5890    5916    5948    5982    5993    6002    6009    6033    6047
                        6053    6067    6107#   6117    6128    6140    6150    6167    6190    6199    6225    6281#   6290
                        6301    6310    6327    6345    6377    6398    6409    6418    6435    6451    6491    6529#   6538
                        6549    6556    6607    6618    6627    6687    6698    6707    6718    6761    6780#   6786    6810
                        6821    6830    6851    6859    6903    6915#   6921    6932    6941    6968    6998    7018#   7052
                        7105    7156    7190    7201    7212    7231    7265    7276    7295    7321    7335#   7352    7366
                        7371    7380    7392    7404    7533    7551#   7661    7676    7681    7690    7710    7718    7727
                        7903    7947#   7963    7977    7984    8001    8053#   8068    8082    8110#   8124    8139    8167#
                        8182    8201    8228#   8242    8257
T1      023720 G        1372    4804#
T10     032554 G        1381    6779#
T11     033000 G        1382    6914#
T12     033160 G        1383    7017#
T12.1   033160          7019#
T12.2   033310          7078#
T12.3   033426          7131#
T12.4   033544          7182#
T12.5   033722          7257#
T13     034064 G        1384    7334#
T14     034614 G        1385    7550#
T15     036360 G        1386    7946#
T16     036462 G        1387    8052#
T17     036550 G        1388    8109#
T18     036620 G        1389    8166#
T19     036670 G        1390    8227#
T2      024230 G        1373    4920#
T2.1    024230          4922#
T2.2    024406          4967#
T2.3    025030          5098#
T3      025544 G        1374    5229#
T4      025676 G        1375    5296#
T4.1    025676          5298#
T4.2    026024          5358#
T5      026724 G        1376    5544#
T5.1    026724          5546#
T5.2    027106          5636#
T6      030136 G        1377    5860#
T6.1    030136          5862#
T6.2    030272          5931#
T6.3    030362          5974#
T6.4    030456          6024#
T7      030716 G        1378    6106#
T7.1    030716          6109#
T7.2    031062          6178#
T8      031340 G        1379    6280#
```

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T8.1    031340          6282#
T8.2    031562          6390#
T9      032042 G        1380    6528#
T9.1    032042          6530#
T9.2    032206          6599#
T9.3    032366          6679#
UAM   = 000200 G        1519#
UPDATE= 000011          1617#   3394
WAIT1   002312          1746#   2180    4169*
WAIT2   002314          1748#   2306    2410    4172*
WAIT3   002316          1750#   3299    4174*
WAIT4   002320          1751#   3299*   3325*
WMAINT  002306          1732#   3014    4227*   4230*   4544    7947
WMODEM= 000005          1613#   2720    3031    4367    4535    4546    6136    6184    6837
WTYPE   002252          1697#   4080*
X     = 000046          1642#   5344    5405    5469    5473
XMTBUF  003240          1862#   3141*   3171*   3176*   3179    3203    3234    3235    3292    3294    3338
X$ALWA= 000000          1231#
X$FALS= 000040          1231#
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X$TRUE= 000020          1231#
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                        7283    7385    7397    7706    7714
$BASEI  011266          2479#   5311    5372    5559    5598    5649    5874    5935    5986    6043    6121    6294    6402
                        6542    6564    6611    6691    6790    6925    7029    7040    7194    7269    7362    7672    7970
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$CCITT  002420          1817#   3122    3205    7616
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                        7686
$DMRIN  012062          2696#   3031    3393    5570    5606    5660    5677    6135    6183    6320    6428    6803    6814
                        6836
$ERROR  012404          2831#   7531    7899    8136    8194    8254
$HALT   012562          2897#   3407    5322    5383    5581    5617    5688    5913    5966    6006    6217    6382    6473
                        6553    6898    6992    7527    7896    7981
$INOUT  014140          3279#   7992    8072    8128    8186    8246
$LOOP   013064          3011#   6050    7370    7680
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$MSCLR  011070          2383#   5232    5251    5302    5362    5550    5640    5866    5978    6029    6113    6286    6394
                        6534    6603    6683    6782    6917    7024    7083    7136    7186    7261    7348    7657    7959
                        8064    8120    8178    8238
$ROMO   012744          2965#   4939    4991    4995    5105
$WAIT   010276          2167#   2487    2528    2585    2608    2711    2786    2905    2918    3400    5896    5953    6146
                        6195    6341    6373    6447    6572    6651    6734    6855    6964    7048    7101    7152    7227
                        7291    7410    7723
.     = 040100          1224#   1842#   1850#   1857#   1862#   1864#   1869#   2200    2202    2323    2325    2427    2429
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                        5527#   5555    5567    5578    5585    5614    5621    5645    5657    5668    5685    5692    5837#
                        5871    5882    5891    5917    5949    5983    5994    6003    6010    6034    6048    6054    6118
                        6129    6141    6151    6168    6191    6200    6251#   6291    6302    6311    6328    6346    6378
                        6399    6410    6419    6436    6452    6513#   6539    6550    6557    6608    6619    6628    6688
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	6689	6788	6923	7027	7038	7192	7267	7968						
BCOMPL	1#	1231#	4044	4049	4054									
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BGNAU	1#	1231#												
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BGNCLN	1#	1231#	4322											
BGNDU	1#	1231#	4762											
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BGNPRO	1#	1231#	3997												
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BGNSET	1#	1231#													
BGNSFT	1#	1231#	8393												
BGNSRV	1#	1231#	4344	4606	4745	4848									
BGNSUB	1#	1231#	4921	4966	5097	5297	5357	5545	5635	5861	5930	5973	6023	6108	6177
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BGNSW	1#	1231#	1438												
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BNERRO	1#	1231#	2490	2588	2611	2715	2789								
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BRESET	1#	1231#	4765												
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CKLOOP	1#	1231#													
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CLOCK	1#	1231#													
CLOSE	1#	1231#													
CLRVEC	1#	1231#	3160	4037	4292	4839	7562	7636	7874						
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ENDHRD	1#	1231#	8292												

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                4833#  4834   4836#  4840#  4841   4844#  4845   4855   4862#  4867   4922#  4923   4931#  4935   4943#
```

```
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          5547    5554#   5566#   5577#   5584#   5590    5613#   5620#   5626    5632#   5633    5636#   5637    5644#   5656#
          5667#   5684#   5691#   5705    5711#   5712    5714#   5715    5720#   5725    5728#   5733    5738#   5743    5749#
          5754    5760#   5765    5771#   5776    5782#   5787    5791#   5792    5862#   5863    5870#   5881#   5890#   5902
          5916#   5921    5927#   5928    5931#   5932    5948#   5959    5970#   5971    5974#   5975    5982#   5993#   6002#
          6009#   6014    6020#   6021    6024#   6025    6033#   6047#   6053#   6061#   6062    6067#   6068    6109#   6110
          6117#   6128#   6140#   6150#   6157    6167#   6174#   6175    6178#   6179    6190#   6199#   6206    6221#   6222
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          7074#   7075    7078#   7079    7105#   7110    7119    7127#   7128    7131#   7132    7156#   7161    7170    7178#
          7179    7182#   7183    7190#   7201#   7212#   7231#   7236    7245    7253#   7254    7257#   7258    7265#   7276#
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          7442    7451    7463    7473    7482    7500    7507    7533#   7534    7554#   7558    7563#   7564    7580#   7581
          7607#   7611    7637#   7638    7642    7647#   7651    7661#   7676#   7681#   7690#   7710#   7718#   7727#   7733
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```

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OPEN               1#  1231#
POINTE             1#  1231#  1249
PRINTB             1#  1231#  2218   2236   2613   3433   3440   3448   3456   3463   3478   3486   3503   3511   3519
                3535   3543   3555   3565   3573   3583   3599   3612   3628   3644   3660   3679   3685   3693   3706
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                5437   5449   5460   5471   5719   5727   5737   5748   5759   5770   5781   6233   6497   7646   7886
PRINTF             1#  1231#  4767
PRINTS             1#  1231#
PRINTX             1#  1231#  4861
READBU             1#  1231#
READEF             1#  1231#  4041   4046   4051   4056
RFLAGS             1#  1231#
SETPRI             1#  1231#  3093   3295   3410   4020   7579
SETVEC             1#  1231#  3077   4137   4144   4275   4806   7553   7606   7858
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SHUTDN   2071#   3405    5320    5381    5579    5615    5686    5911    5964    6004    6215    6380    6471    6551    6896
         6990    7525    7894    7979
SLASH       1#   1231#
STARS       1#   1231#
SVC         1#   1229#   1230
WAIT     1947#   2485    2502    2526    2535    2583    2599    2606    2709    2735    2784    2799    2903    2910    2916
         3398    5894    5907    5951    6144    6162    6193    6211    6339    6371    6445    6570    6649    6732    6853
         6962    7046    7099    7150    7225    7289    7408    7721
XFER        1#   1231#
XFERF       1#   1231#
XFERT       1#   1231#


. ABS.  040100     000


 ERRORS DETECTED:  0

 CZDMID/I,CZDMID.SEQ/DOC/CRF/NL:OC/SOL=SVC34R.MLB,CZDMID.P11
 RUN-TIME:  34  42  4 SECONDS
 RUN-TIME RATIO: 140/81=1.7
 CORE USED:  19K  (37 PAGES)

 DOCUMENT PAGES:  208
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