DV11

DV11 MODEM CNTRL

CZDVEC0

AH-8745C-MC

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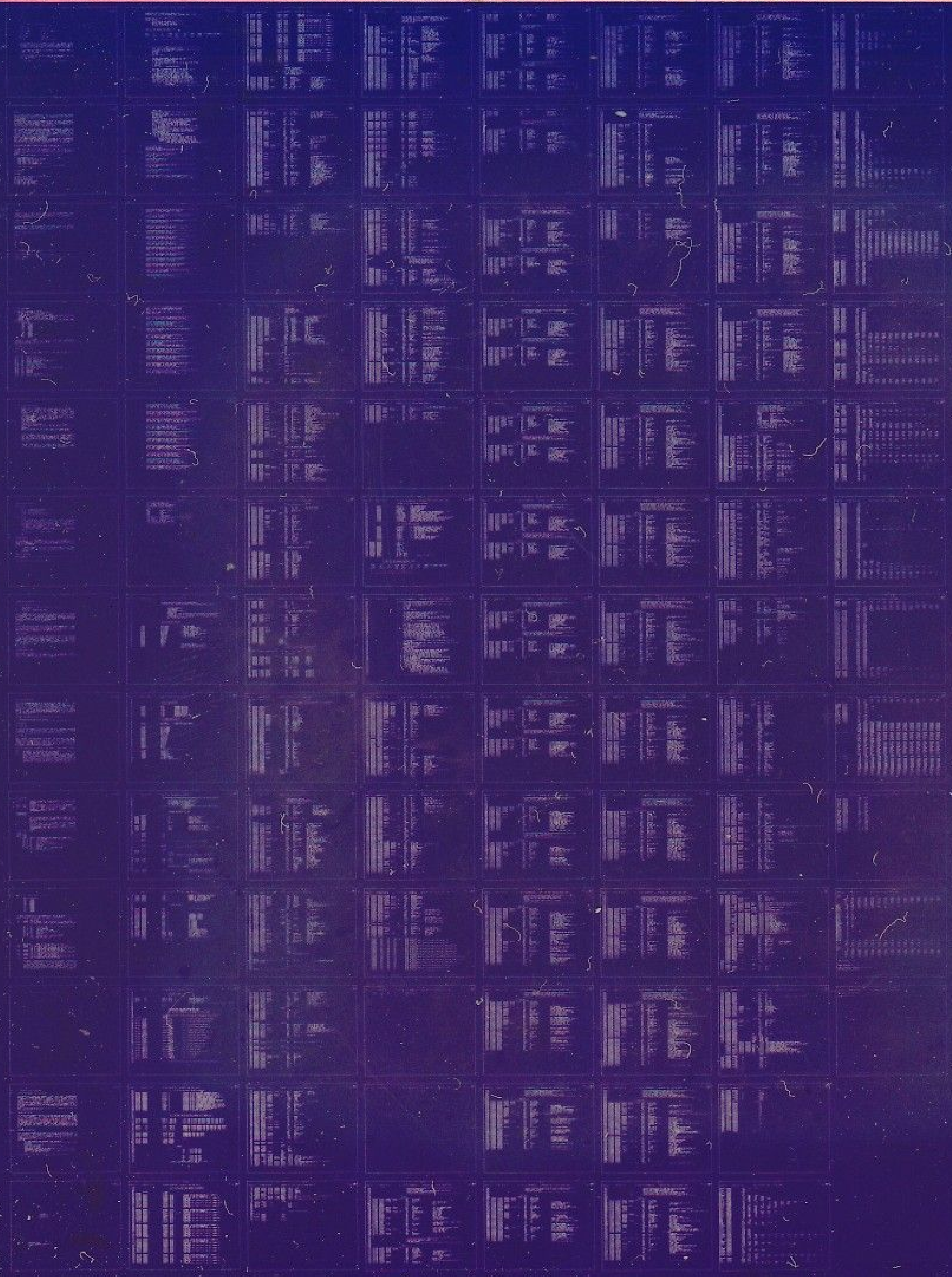

IDENTIFICATION

PRODUCT CODE:	AC-8744C-MC
PRODUCT NAME:	CZDVECO DV11 MODEM CNTRL
DATE RELEASED:	MARCH 1979
MAINTAINER:	DIAGNOSTICS
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1. ABSTRACT

The function of the DV11 diagnostics are to verify that the option operates according to specifications. The diagnostics verfiy that there are no malfunctions and the all operations of the DV11 are correct in its enviroment.
Parameters may be set to alert diagnostics as to the DV11 configuration by using the ''TRIAL'' program (CZDVE SA:210). All questions should be answered and then each diagnostic will ''OVERLAY'' these parameters which are stored in the ''STATUS TABLE'' (see section 8.4a). The alternative to ''TRIAL'' program is ''AUTO SIZING'' (see section 8.5).

CZDVE is used to verify the cables used for modem hook up. Modem bits are tested and interupts are also checked. All signals are tested and the turn around is either through the single line tester(h325) or 16 line turn around(h861). All signals that are looped around by the test connecter are checked. Modem control signals AND DV11 transmitter and receiver data is checked. Any combination of lines may be selected and these inturn will be tested individually.
Part 2 -THE MANUAL PARAMETER INPUT(TRIAL)- IS USED TO GET THE PARAMETERS INTO THE STATUS TABLE FOR REFERENCE BY THE DIAGNOSTIC IF ''AUTO SIZING'' does not work or is not desired. Starting address is at 210 and the execution of the program is self explanatory. (answer the questions).

Note:czdvec has been enhanced to be able to run with all the character lengths (5,6,7 and 8), with parity option enabled(odd/even).

Currently there are six off line diagnostics that are to be run in sequence to insure that if an error should occur it will be detected at an early stage and insuring that diagnosis of error will be immediate to problem
NOTE: Additional diagnostics may be added in the future.

The six diagnostics are:
1. DZDVA [REV] Basis R/W test and ROM instruction exerciser.
2. CZDVB [REV] DV11 STAT LN CD TSTS
3. CZDVC [REV] ROM TST PRT 1
4. DZDVD [REV] 'FREE RUNNING' Rom tests part 2.
5. CZDVE [REV] DV11 MODEM CNTRL
   [TRIAL PROGRAM]
6. CZDVF [REV] Asynchronous line card tests.

2. REQUIREMENTS

2.1 EQUIPMENT

Any PDP11 family CPU (WITH MINIMUM 8K MEMORY)
ASR 33 (or equilivalent)
DV11-AA MUX CNTRL UNIT
AT LEAST ONE OF THE FOLLOWING
DV11-BA 8 LINE SYNC MODULES
DV11-BB 8 LINE ASYNC MODULES
DV11-BC 4 SYNC LINES, 4 ASYNC LINES

2.2 STORAGE

Program will use all 8K of memory except where ABL and BOOTSTRAP LOADER reside. Location 1500 thru 1736 are especially to be noted and to be untouched by operator after DV11 trial program has been executed; or after the 'AUTO SIZING' has been done.

3. LOADING PROCEEDURE`

3.1 METHOD

All programs are in absolute format and are loaded using the ABSOLUTE LOADER. NOTE: if the diagnostics are on a media such as DISK ,MAGTAPE,DECTAPE, or CASSETTE; follow instructions for the monitor which has been provided on that specific media.

ABSOLUTE LOADER starting address *500

MEMORY	* SIZE
4k	17
8k	37
12k	57
16k	77
20k	117
24k	137
28k	157

3.1.1 Place address of ABS loader into switch register.
(also place 'HALT' SW up)

3.1.2 Depress 'LOAD ADDRESS' key on console and release.

3.1.3 Depress 'START KEY' on console and release (program should now be loading into CPU)

4. STARTING PROCEEDURE

A. Set switch register to 000200
B. Depress 'LOAD ADDRESS' key and release
C. Set SWR to zero for 'AUTO SIZING' or leave
   leave SWR bit 7=1 to use existing parameters set up by DV11 trial program or a previously run DV11 diagnostic that used the 'AUTO SIZING'.(section 7.2 and 8.4,8.5 may be helpful)
D. Depress 'START KEY' and release the program will type Maindec Name and program name (if this was the first start up of the program) and also the following:

```
          'MAP OF DV11 STATUS'
          1500     175000
          1502     000300
          1504     000226
          1506     000062
          1510     000226
          1512     000062
          1514     000226
          1516     000062
          1520     000226
          1522     000062
```

The above is only an example! This would indicate the status table starting at add. 1500 in the program. THE STATUS TABLE MUST BE VERIFIED BY THE USER IF AUTO SIZING IS DONE. For information of status table see section 8.4 for help.

The program will type 'R' and proceed to run the diagnostic

4.1 CONTROL SWITCH SETTINGS

NOTE: If there is no real SWR (177570); SWR may be modified at Loc:176 or by hitting Control ''G'' <^G> on console terminal.

SW 15	Set:	Halt on error
SW 14	Set:	Loop on current test
SW 13	Set:	Inhibit error print out
SW 12	Set:	Inhibit **ALL** type out/bell on error.
SW 11	Set:	Inhibit iterations. (quick pass)
SW 10	Set:	Escape to next test
SW 09	Set:	Loop with current data
SW 08	Set:	Catch error and loop on it
SW 07	Set:	Use previous status table. CLR-do AUTO SIZE.
SW 06	Set:	Set- single H325 turn around Clr- multi H325 turn around
SW 05	Set:	Reserved
SW 04	Set:	Reserved
SW 03	Set:	Reserved
SW 02	Set:	Lock on selected test
SW 01	Set:	Restart program at selected test
SW 00	Set:	Reselect DV11's desired active.

```
4.1.2   SWITCH REGISTER RESTRICTIONS

        SW 00   RESELECT DV11'S DESIRED ACTIVE.  please note that a  message  is
                typed  out  for  setting  the  switch  register  equal to DV11's
                active.  this  means  if  the  system  has  four  DV11s;   bits
                00,01,02,03  will  be  set  in  loc  'DVACTV'  from  the  switch
                register.    Using     this      switch(SW00)      alters     that
                location;therefore  if four DV11s are in the system ***DO NOT***
                set switchs greater than SW 03 in the up position.  this  would
                be a fatal error.  do not select more active DV11s than has been
                given information about in trial program.
METHOD: A:      Load address 200
        B:      Start with SW 00=1
        C:      Program will type message
        D:      Set the binary number of  DV11s  desired  active  EXAMPLE:   1=1
                DV11;   3=2  DV11;   7=3  DV11;  17=4 DV11 37=5 DV11 etc.  PRESS
                CONTINUE.
        E:      Number (IF VALID) will be in data lights (excluding 11/05)
        F:      Set with any other switch settings desired.  PRESS CONTINUE.


        SW 01   RESTART PROGRAM AT SELECTED TEST         it is strongly suggested
                that  at least one pass hass been made before trying to select a
                test that is not in the order of sequence the  reason  being  is
                that the program has to clear areas and set up parameters.  Also
                when a test is selected ALWAYS START AT THE  VERY  BEGINNING  OF
                THAT TEST.

        SW 09   LOOP ON CURRENT DATA:   this  switch  will  only  work  if  call
                'SCOP1'  is in that test.  The reason being that most tests deal
                with blocks of different data to be sent or received all at once
                thus in block data;  one pattern cann't be singled out.
```

4.1.3 SWITCH REGISTER PRIORITYS

ERROR SWITCHES

1. SW 12 Delete print out/bell on error.
2. SW 13 Delete error printout.
3. SW 15 Halt on the error.
4. SW 08 Goto beginning of the test(on error).
5. SW 10 Goto next test(on error).

SCOPE SWITCHES

1. SW 09 (if enabled by 'SCOP1') on an error; If an '*' is printed in front of the test no. (ex. *TEST NO. 10) SW09 is incorporated in that test and therefore SW09 is *usually* the best switch for the scope loop (SW14=0, SW10=0, SW09=1, SW08=0). If SW09 is not enabeled; and there is a *HARD* error (constant); SW08 is best.
   (SW14=1,0, SW10=0, SW09=0, SW08=1). for intermittemt errors; SW14=1 will loop on test reguardless of error or not error.
   (SW14=1, SW10=0, SW09=0, SW08=1,0)
2. SW 14
3. SW 11

4.2 STARTING ADDRESS

starting address is at 000200 there are no other starting addresses for the DV11 diagnostics previously mentioned except for CZDVE which is: 000200 for the modem control and cable tests and 000210 for the manual parameter input program.

NOTE: If address 000042 is non-zero the program assumes it is under ACT11 or XXDP control and will act accordingly after *ALL* available DV11's are tested the program will return to 'XXDP' or 'ACT-11'.

5. OPERATING PROCEDURE

When program is initially started messages as described in section four will be printed.

and program will begin running the diagnostic

5.2 PROGRAM AND/OR OPERATOR ACTION

The typical approach should be

1. Halt on error (via SW 15=1) when ever an error occurs.
2. Clear SW 15.
3. Set SW 14: (loop on this test)
4. Set SW 13: (inhibit error print out)

The TEST NUMBER and PC will be typed out and possibily an error message (this depends on the test) to give the operator an idea as to the source of the problem. if it is necessary to know more information concerning the error report; LOOK IN THE LISTING for that TEST NUMBER which was typed out and then NOTE THE PC of thE ERROR REPORT this way the EXACT FUNCTIONING of the test CAN BE INTERPEDITED.

6. ERRORS

As described previously there will always be a TEST NUMBER and PC typed out at the time of an error (providing SW 13=0 and SW 12=0). in most cases additional information will be supplied to the the error message which is to give the operator an indication of the error.

6.2 ERROR RECOVERY

If for some reason the DV11 should 'HANG THE BUS' (gain control of bus so that console manual functions are inhibited) an init or power down/up is necessary for operator to regain control of cpu. If this should happen; look in location 'TSTNO' (address 1224)for the number of the test that was running at the time of the catastrophic error. In this way the operator will have an idea as to what the DV11 was doing at the time of the error.

7. RESTRICTIONS

7.1 STARTING RESTRICTIONS

See section 4. (PLEASE)
Status table should be verified reguardless of how program was started. Also it is important to use this listing along with the information printed on the TTY to completly isolate problems.

7.2 OPERATING RESTRICTIONS

DV11 trial program must be run prior to the first and only the first running of any DV11 diagnostic if ''AUTO SIZING'' is not used.
NOTE: If no program other than a DV11 diagnostic was loaded after DV11 trial or if core memory has not been changed;or if there is no DV11 configuration changes; the DV11 trial program need never be run again. However if any of the above have been violated the DV11 trial program must be run again before running the diagnostics NOTE: An alternative to the above is attempting the 'AUTO SIZING' when program is initially started with SW07=0.

7.3 HARDWARE CONFIGURATION RESTRICTIONS (SYNC LINE CARDS ONLY)

1. Hardware must be set to FULL DUPLEX
2. All lines of a particular line card must be configured the same.

8. MISCELLANEOUS

8.1 EXECUTION TIME

All DV11 device diagnostics will give an 'END PASS' message (providing no errors and sw12=0) within 4 mins. This is assuming SW11=1 (DELETE ITERATIONS) is set to give the fastest possible execution. The actual execution time depends greatly on the PDP11 CPU configuration.

8.2 PASS COMPLETE

NOTE: *EVERY* time the program is started; the tests will run as if SW11 (delete iterations) was up (=1). This is to 'VERIFY NO *HARD* ERRORS' as soon as possible. Therefore the first pass -EACH TIME PROGRAM IS STARTED- will be a 'QUICK PASS' untill all DV11's in system are tested. When the diagnostic has completed a pass the following is an example of the print out to be expected.

```
END PASS CZDVECO CSR:  175000 VEC:  300 PASSES:  000001 ERRORS:  000000
```

NOTE: The numbers for CSR and VEC are not necessarily the values for the device. They are only for this example.
NOTE: CZDVE (MODEM AND CABLE TEST) END PASS message is a large 'END'' typed out on tty. Please note that each character printed is actually and 'END PASS'' indication. This was used in place of 'BELL'' because if sw12=1 and an error occured the BELL may be mistaken for END PASS. The pass execution is so fast that the standard END PASS was too lenghtly. THEREFORE each char is an 'END PASS and the entire 'END'' is not required for acceptance.

```
8.4     KEY LOCATIONS

        RETURN (1212)   Contains the address  where  program  will  return  when
                        iteration  count  is  reached  or  if  loop  on  test is
                        asserted.
        NEXT   (1214)   Contains the address of the next test to be peformed.
        TSTNO  (1224)   Contains the number of the test now being peformed.
        RUN    (1302)   The bit  in  'RUN'  always  points  one  past  the  DV11
                        currently     being     tesied.     EXAMPLE:       (RUN)
                        1302/0000000001000000 Means that DV11 no.05 is the  DV11
                        now running.
        DVCR00-DVCR17
        DVST00-DVST17
        (1500)-(1736)
                        These locations contain the information needed  to  test
                        up  to  8 (decimal) DV11s sequentialy.  they contain the
                        CSR,VECTOR and STATUS concerning  the  configuration  of
                        each DV11.
        DVACTV (1276)   Each  bit  set  in  this  location  indicates  that  the
                        associated  DV11  will  be  tested  in  turn.  EXAMPLE:
                        (DVACTV)  1276/0000000000011111  means  that  DV11   no.
                        00,01,02,03,04   will  be  tested.  EXAMPLE:   (DVACTV)
                        1276/0000000000010001 Means that DV11 no.  00,04 will be
                        tested.
        DVSCR  (1356)   Contains the receiver csr  of  the  current  DV11  under
                        test.
        L00.03 (1412)
        L04.07 (1414)
        L08.11 (1416)
        L12.15 (1420)   Contains the status of the current DV11 under test.
                BIT 15  Set:    Line card *NOT installed (AND WONT BE TESTED)
                BIT 14  Set:    Parity enabled
                BIT 13  Set:    Even parity selected
                BIT 12  Set:    One sync, =0:  two syncs.
                BIT 11  Set:    Async line card, =0 Sync line card.
                BIT 10  Set:    Reserved
                BIT 09   Set:   Bits per char.  (used with bit8)
                BIT 08  Set:    Bits per char.  (used with bit9)
                        BIT09 BIT08 BITS PER CHAR.
                          0     0       8
                          0     1       7
                          1     0       6
                          1     1       5
                BIT 07-00       SYNC "A" for specified line card.
```

8.4A MORE ON THAT 'STATUS TABLE' (1500-1736)

```
'MAP OF DV11 STATUS'
1500    175000
1502    000300
1504    000226
1506    000062
1510    000226
1512    000062
1514    004000
1516    000000
1520    004000
1522    000000
```

The above information will be repeated for each of up to 8 DV11's in the system(these will follow under this table). EXPLANATION:

```
1500    175000  This is the system control register for the 1st DV11  in
                the system.
1502    000300  This is vector 'A' for the first DV11 in the system.
1504    000226  This represents 'SYNC A' and the software status for the
                1st line card in the 1st DV11.  The bits are as follows:

        BIT 15  Set:    Line card *NOT installed (AND WONT BE TESTED)
        BIT 14  Set:    Parity enabled
        BIT 13  Set:    Even parity selected
        BIT 12  Set:    One sync, =0:  two syncs.
        BIT 11  Set:    Async line card, =0 Sync line card
        BIT 10  Set:    Reserved
        BIT 09   Set:   Bits per char.  (used with bit8)
        BIT 08  Set:    Bits per char.  (used with bit9)
                BIT09 BIT08 BITS PER CHAR.
                  0     0      8
                  0     1      7
                  1     0      6
                  1     1      5
        BIT 07-00       SYNC 'A' for specified line card.
1506    000062  This represents 'SYNC B' for the 1st line card.
1510    000226  This is 'SYNC A' and line status for the 2nd line  card.
                (for bits defination see explanation for line card 1).
1512    000062  This is 'SYNC B' for the second line card.
1514    000226  This is 'SYNC A' and line status for the 3rd line  card.
                (for bits defination see explanation  for line card 1).
1516    000062  This is 'SYNC B' for line card no.  3.
1520    000226  This is 'SYNC A' and line status for the 4th line  card.
                (for bits defination see explanation for line card 1).
1522    000062  This is SYNC B for the 4th line card.
```

The above is repeated for each DV11 in the system. The table is filled by AUTO SIZING or by the manual parameter input program as described previously. Also if desired by user; the locations may be altered by hand (toggled in) to suit the specific configuration.**note** when character length is less than 8 bits, be sure to setup correct sync character in switches of sync recognition logic. ie: if 226 for 8 bit character , then it should be 026 for 7 bit character.

8.5 *** METHOD OF AUTO SIZING ***

8.5.1 FINDING THE CONTROL STATUS REGISTER.

The program will start at address 175000 and start 'REFERENCEING' address. If a NON-EX MEMORY TRAP occures; the pointer (holding 175000) is updated by 10 and the above is repeated untill address 175200 is reached. If a 'SLAVE SYNC RESPONSE' was issued by the DV11 (or any other device) (no nxm trap) ; pointer plus 12 (SEL12) is tested to contain 177777 (MUST BE EXACTLY 177777); if a trap is encountered or if SEL12 does not contain 177777 the above updating is performed. If SEL12 was equal to 177777 the pointer is stored away and the routine continues as above:
NOTE: If the program does not find your DV11; something is wrong and AUTO SIZING should not be done.

8.5.2 FINDING THE VECTOR

The vector area (address 300-776) is filled with the instruction IOT and '.+2' (next address). Bit7 and Bit6 (RX INTERUPT AND RX INTERUPT IE) are set into DVscr register; a delay is made and if no interupt occures (because of a bad DV11) the program assumes vector address 300 and the problem should be fixed in the diagnostic. Once the problem is fixed; the program should be re-setup again to get correct vector. If an interupt occured; the address to which the DV11 interupted to is picked up and reported as the vector. NOTE: if the vector reported is not the vector set up by you; there is a problem and AUTO SIZING should not be done.

8.5.3 PARAMETER ASSUMPTIONS.

Since too much hardware would need to be turned on to SIZE the rest of the parameters; the program must assume the remaining variations. The result if not to your specific configuration may be altered by hang (toggle in) is desired. In this way 95% of the parameter setup was done by the program and 5% by you.
THEREFORE:

1) ALL LINE CARDS(4) ARE ASSUMED TO BE INSTALLED.
   Set Bit15 of status map of any (appropriate) line cards missing
2) TWO SYNCS.
   Set Bit12 if you have a 4 line group set for 1 sync.
3) EIGHT BITS PER CHAR.
   Adjust bits 9 and bit 8 in status map for your correct config.
4) SYNCHRONOUS LINE CARDS INSTALLED
   Set Bit11 of status map for Async line card and zero Sync chars.
5) SYNC 'A'=226 AND SYNC 'B'=062

In all adjustments please refer to section 8.4a for greater detail.

DOCUMENT
****
CZDVEC LST
****

```
         ------------------------------------------------------------------

1121     ROUTINE USED TO "AUTO SIZE" THE DV11
         CSR AND VECTOR.
         NOTE:    THE CSR MAY BE ANY WHERE IN THE FLOATING
                  ADDRESS RANGE (175000:175400)
                  AND THE VECTOR MAY BE ANY WHERE IN THE
                  FLOATING VECTOR RANGE (300:770)


         TABLE OF LOOP AROUND FUNCTIONS  (H325)
         ---------------------------------

         RING      CO       CTS      SECRX   SECTX      RTS      TRDY     LENAB  *** SIGNALS FOR ASYNC LC.
         RING      CO       CTS       DSR     NS        RTS      TRDY     LENAB  *** SIGNALS FOR SYNC LC
         BIT07    BIT06    BIT05    BIT04    BIT03    BIT02    BIT01    BIT00
                                       ^----------^
                     ^----------^---------------------------^
            ^--------------------------------------------------------^



1267     *********************************************************************
                  THIS "TEST 1" IS NOT ACTUALLY A TEST.
                  IT IS USED TO GET USERS INPUTS FOR WHICH LINE(S) ARE TO BE
                  EXERCISED. THE PROGRAM WILL TYPE OUT:
                  (A) H325
                  (B) H861
                  TYPE "A" "OR "B"

                  THE H325 TURN AROUND IS USED FOR THE SINGLE LINE
                  TURN AROUND AT THE DISTRIBUTION PANEL OR
                  AT THE END OF THE MODEM CABLE.
                  THE H861 TURN AROUND IS USED FOR THE 16 LINE TURN AROUND.
                  IF THE H325 WAS SELECTED (A) THE FOLLOWING WILL BE TYPED
                  IF SW06=0:
                  SELECT LINE(S):  XXXXXXXXXXXXXXXX

                  THE FIRST "X" REPRESENTS LINE 15 AND EACH "X" IS THE
                  NEXT LOWER LINE TILL THE LAST "X" IS LINE 0. TYPE
                  A "1" OR A "0" UNDER THE APPROIATE "X"(LINE)
                  TO EITHER SELECT(1) OR NOT TEST(0) EACH LINE.
                  AFTER ALL 1'S AND 0'S ARE TYPED; TYPE A <CR>.
                  THE PROGRAM WILL TYPE OUT IN OCTAL THE LINES YOU
                  HAVE SELECTED; AND THE PROGRAM WILL BEGIN RUNNING
                  THE HIGHEST SELECTED LINE THROUGH *ALL* TESTS THEN
                  UPDATING TO THE NEXT LOWEST LINE TILL ALL SELECTED
                  LINES ARE DONE. THEN THE PROGRAM WILL TYPE AN
                  "END" CHAR.  PLEASE READ  THE SECTION ON PASS COMPLETE
                                 IN DOCUMENT.
                  IF THE H325 IS SELECTED AND SW06=1 THE FOLLOWING WILL BE TYPED:
```

```
                SINGLE LINE:
                THE USER MUST THEN TYPE IN A SINGLE LINE HE DESIRES (00-17) -OCTAL-
                END PASS IS THE SAME.
                REGUARDLESS OF WHICH CONNECTOR WAS SELECTED; THE
                THE LAST QUESTION IS:
                MODEM VECTOR:
                (THIS WILL BE ASKED ONLY AT THE INIATL START OF PROGRAM
                OR WHEN A DIFFERENT DV11 IN THE SYSTEM IS UNDER TEST)
                TYPE IN THE VECTOR OF THE MODEM CONTROL(300:774).
                THE CSR(MC.CSR) IS ASSUMED TO BE =DVSCR+20.
                NOTE:   IF CABLE TESTS ARE TO BE DONE ON OTHER
                DV11'S IN SYSTEM; SELECT THEM BY USING SW00 AS DESCRIBED
                IN THE DOCUMENTATION.
                UNLESS LOCATION 42 IS NON-ZERO IN WHICH CASE THE PROGRAM
                ASSUMES ITS UNDER ACT-11 MONITOR.  THE PROGRAM WILL
                CYCLE THROUGH ALL DV11S AND MODEM CONTROL *HOWEVER*
                THE RESTRICTIONS ARE:
                ***ALL*** MODEM VECTORS MUST BE AT 300
                ***ALL*** TURN AROUNDS MUST BE H861.
                ''LONG END PASS'' WILL BE GIVEN AT END OF LARGE END TO
                        INDICATE DEVICES TESTED. PASSES TYPED IN THIS
                        MESSAGE DO NOT INDICATE PASSES BUT RATHER THE
                        NUMBER OF FULL PASSES THROUGH MULTIPLE DEVICES.
                                !LARGE END AND TYPE OUT MAY BE INHIBITED BY SW12!
        *******************************************************************

1466    *********************** TEST 2 ********************************
        INITIALIZATION CHECK
        VERIFY THAT CONTROL STATUS REGISTER AND LINE STATUS
        REGISTER WERE CLEARED BY INITIALIZE

1503    *********************** TEST 3 ********************************
        VERIFY THAT ''INTERUPT ENABLE'' CAN BE
        SET AND CLEARED.

1530    *********************** TEST 4 ********************************
        VERIFY THAT ''DONE'' CAN BE
        SET AND CLEARED.

1557    *********************** TEST 5 ********************************
        VERIFY THAT ''MAINTENANCE MODE'' CAN BE
        SET AND CLEARED.

1584    *********************** TEST 6 ********************************
        VERIFY THAT ''SCAN ENABLE'' CAN BE
        SET AND CLEARED.

1610    *********************** TEST 7 ********************************
        VERIFY THAT ''BUSY'' IS SET WHEN ''SCAN ENABLE'' IS SET
        VERIFY THAT ''BUSY'' IS CLEARED WHEN ''SCAN ENABLE'' IS CLEARED
```

```
1638    ************************ TEST 10 ********************************
        VERIFY THAT SETTING 'DONE'' DOES NOT CAUSE AN
        INTERRUPT IF ''INTERRUPT ENABLE'' IS CLEARED.

1659    ************************ TEST 11 ********************************
        VERIFY THAT NO INTERRUPT OCCURS WITH ''INTERRUPT ENABLE''
        SET AND 'DONE'' CLEARED.

1680    ************************ TEST 12 ********************************
        VERIFY THAT SETTING 'DONE'' CAUSES AN INTERRUPT
        WITH ''INTERRUPT ENABLE'' SET

1703    ************************ TEST 13 ********************************
        VERIFY THAT NO INTERRUPT OCCURS WITH
        ''INTERRUPT ENABLE'' SET AND 'DONE'' SET AT PRIORITY 7.

1724    ************************ TEST 14 ********************************
        VERIFY THAT NO INTERRUPT OCCURS WITH
        ''INTERRUPT ENABLE'' SET AND 'DONE'' SET AT PRIORITY 6.

1745    ************************ TEST 15 ********************************
        VERIFY THAT NO INTERRUPT OCCURS WITH
        ''INTERRUPT ENABLE'' SET AND 'DONE'' SET AT PRIORITY 5.

1766    ************************ TEST 16 ********************************
        VERIFY THAT NO INTERRUPT OCCURS WITH
        ''INTERRUPT ENABLE'' SET AND 'DONE'' SET AT PRIORITY 4.

1787    ************************ TEST 17 ********************************
        VERIFY THAT AN INTERRUPT OCCURS WITH ''INTERRUPT
        ENABLE'' SET AND 'DONE'' SET AT PRIORITY 0.

1808    ************************ TEST 20 ********************************
        VERIFY THAT AN INTERRUPT OCCURS WITH ''INTERRUPT
        ENABLE'' SET AND 'DONE'' SET AT PRIORITY 1.

1829    ************************ TEST 21 ********************************
        VERIFY THAT AN INTERRUPT OCCURS WITH ''INTERRUPT
        ENABLE'' SET AND 'DONE'' SET AT PRIORITY 2.

1850    ************************ TEST 22 ********************************
        VERIFY THAT AN INTERRUPT OCCURS WITH ''INTERRUPT
        ENABLE'' SET AND 'DONE'' SET AT PRIORITY 3.

1870    ************************ TEST 23 ********************************
        VERIFY THAT ALL LINE NUMBERS CAN BE WRITTEN INTO AND
        READ BACK FROM LINE COUNTER

1896    ************************ TEST 24 ********************************
        USING ''STEP'' MODE, VERIFY THAT THE
        LINE COUNTER CAN BE STEPPED THRU ALL STATES.
```

```
1923    ************************ TEST 25 ********************************
        WRITE 1'S INTO ALL SCANNER MEMORY LOCATIONS.
        VERIFY THAT ALL LOCATIONS HAVE BEEN WRITTEN
        TO 1'S.
        VERIFY THAT ''CLEAR SCAN'' CLEARS ALL SCANNER
        MEMORY LOCATIONS.

1975    ************************ TEST 26 ********************************
        WRITE 1'S INTO SELECTED SCANNER MEMORY LOCATION.
        VERIFY THAT ONLY SELECTED LOCATION WAS WRITTEN INTO.

2018    ************************ TEST 27 ********************************
        WITH ALL SCANNER MEMORY LOCATIONS SET TO 1'S,
        WRITE 0'S INTO SELECTED LOCATION
        VERIFY THAT ONLY SELECTED LOCATION WAS CLEARED.

2062    ************************ TEST 30 ********************************
        VERIFY THAT ''CLEAR MULTIPLXER'' CLEARS ALL MULTIPLEXER
        FUNCTION FLIP-FLOPS

2103    ************************ TEST 31 ********************************
        WRITE 1'S INTO ALL SCANNER MEMORY LOCATIONS
        SET ''LINE ENABLE FOR ALL LINES
        VERIFY THAT AN INTERRUPT OCCURS FOR EACH LINE

2157    ************************ TEST 32 ********************************
        WRITE 1'S INTO ALL MULTIPLEXER FUNCTION FLIP-FLOPS
        CLEAR SCANNER MEMORY
        VERIFY THAT AN INTERRUPT OCCURS FOR EACH LINE
        THIS TEST IS DONE IF THE H861 TURN AROUND IS USED.

2235    ************************ TEST 33 ********************************
        VERIFY THAT LINE ENABLE FUNCTION FLIP-FLOP CAN
        BE SET AND CLEARED FOR SELECTED LINE
        THIS TEST IS DONE IF THE H325 TURN AROUND IS USED

2282    ************************ TEST 34 ********************************
        VERIFY THAT TERMINAL READY FUNCTION FLIP-FLOP CAN
        BE SET AND CLEARED FOR SELECTED LINE
        THIS TEST IS DONE IF THE H325 TURN AROUND IS USED

2329    ************************ TEST 35 ********************************
        VERIFY THAT REQUEST TO SEND FUNCTION FLIP-FLOP CAN
        BE SET AND CLEARED FOR SELECTED LINE
        THIS TEST IS DONE IF THE H325 TURN AROUND IS USED

2376    ************************ TEST 36 ********************************
        VERIFY THAT NEW SYNC (SECTX IF ASYNC LC) FUNCTION FLIP-FLOP CAN
        BE SET AND CLEARED FOR SELECTED LINE
        THIS TEST IS DONE IF THE H325 TURN AROUND IS USED
```

```
2424        ************************* TEST 37 *********************************
            VERIFY THAT RING IS SET IF ''LINE ENABLE''
            AND TERMINAL ARE SET FOR SELECTED LINE.
            THIS TEST IS DONE IF THE H325 TURN AROUND IS USED

2471        ************************* TEST 40 *********************************
            VERIFY THAT CLEAR TO SEND AND CARRIER ARE SET IF ''LINE ENABLE''
            AND REQUEST TO SEND ARE SET FOR SELECTED LINE.
            THIS TEST IS DONE IF THE H325 TURN AROUND IS USED

2518        ************************* TEST 41 *********************************
            VERIFY THAT DATA SET READY(SECRX IF ASYNC LC) IS SET IF ''LINE ENABLE''
            AND NEW SYNC (SECTX IF ASYNC LC) ARE SET FOR SELECTED LINE.
            THIS TEST IS DONE IF THE H325 TURN AROUND IS USED

2564        ************************* TEST 42 *********************************
            VERIFY THAT LINE ENABLE FUNCTION FLIP-FLOP CAN
            BE SET AND CLEARED FOR SELECTED LINE
            THIS TEST IS DONE IF THE H861 TURN AROUND IS USED.

2618        ************************* TEST 43 *********************************
            VERIFY THAT TERMINAL READY FUNCTION FLIP-FLOP CAN
            BE SET AND CLEARED FOR SELECTED LINE
            THIS TEST IS DONE IF THE H861 TURN AROUND IS USED.

2672        ************************* TEST 44 *********************************
            VERIFY THAT REQUEST TO SEND FUNCTION FLIP-FLOP CAN
            BE SET AND CLEARED FOR SELECTED LINE
            THIS TEST IS DONE IF THE H861 TURN AROUND IS USED.

2726        ************************* TEST 45 *********************************
            VERIFY THAT SECONDARY TRANSMIT FUNCTION FLIP-FLOP CAN
            BE SET AND CLEARED FOR SELECTED LINE
            THIS TEST IS DONE IF THE H861 TURN AROUND IS USED.

2781        ************************* TEST 46 *********************************
            VERIFY THAT CLEAR TO SEND AND CARRIER ARE SET IF ''LINE ENABLE''
            AND TERMINAL ARE SET FOR SELECTED LINE.
            THIS TEST IS DONE IF THE H861 TURN AROUND IS USED.

2835        ************************* TEST 47 *********************************
            VERIFY THAT RING IS SET IF ''LINE ENABLE''
            AND REQUEST TO SEND ARE SET FOR SELECTED LINE.
            THIS TEST IS DONE IF THE H861 TURN AROUND IS USED.

2889        ************************* TEST 50 *********************************
            VERIFY THAT SECONDARY RECEIVE IS SET IF ''LINE ENABLE''
            AND SECONDARY TRANSMIT ARE SET FOR SELECTED LINE.
            THIS TEST IS DONE IF THE H861 TURN AROUND IS USED.
```

```
2942    ************************ TEST 51 *******************************
        DV11 SINGLE LINE CABLE TEST.
        TEST TO RUN A 5 BIT BLOCK (000-037)
        OF DATA FROM THE DV11 TRANSMITTER INTO THE
        DV11 RECEIVER THROUGH THE CABLE.
        SETUP:
        MODE:           EXTERNAL LOOP BACK
        TXBA:           SYNC
        TXWC:           -42(8)-BIT15
        RXBA            RXBA
        RXWC:           -40(8)-BIT15
        LINE PROTOCOL TXDDCMP,RXDDCMP,LRC8,STRIP SYNC,IDLE MARK
        LINE STATE      EXPECT BCC,TX GO
        LINE PROGRESS   SEND BCC
        NOTE: FOR TEST OF ASYNC LINE CARD;
         ''SYNC 'A''' MUST BE SET TO ALL ZEROS
         IN SOFTWARE STATUS MAP.
```

```

                                  ;*AC-8744C-MC/<377>/CZDVECO DV11 MODEM CNTRL
                                  ;*COPYRIGHT 1972, DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754
                                  ;*------------------------------------------------------------------------

                                          ;STARTING PROCEDURE
                                          ;LOAD PROGRAM
                                          ;LOAD ADDRESS 000200
                                          ;PRESS START
                                          ;PROGRAM WILL TYPE ''AC-8744C-MC/<377>/CZDVECO DV11 MODEM CNTRL''
                                          ;PROGRAM WILL TYPE 'R'' TO INDICATE THAT TESTING HAS STARTED
                                          ;AT THE END OF A PASS, PROGRAM WILL TYPE PASS COMPLETE MESSAGE
                                          ;AND THEN RESUME TESTING


                                  ;SWITCH REGISTER OPTIONS
                                  ;------------------------

        100000                    SW15=100000            ;=1,HALT ON ERROR
        040000                    SW14=40000             ;=1,LOOP ON CURRENT TEST
        020000                    SW13=20000             ;=1,INHIBIT ERROR TYPEOUT
        010000                    SW12=10000             ;=1,DELETE TYPEOUT/BELL ON ERROR.
        004000                    SW11=4000              ;=1,INHIBIT ITERATIONS
        002000                    SW10=2000              ;=1,ESCAPE TO NEXT TEST ON ERROR
        001000                    SW09=1000              ;=1,LOOP WITH CURRENT DATA
        000400                    SW08=400               ;=1,LOOP ON ERROR
        000200                    SW07=200               ;=1, DO ''AUTO SIZING'' ON INITAL START UP.
        000100                    SW06=100
        000040                    SW05=40
        000020                    SW04=20
        000010                    SW03=10
        000004                    SW02=4                 ;LOCK ON TEST SELECT
        000002                    SW01=2                 ;RESTART PROGRAM AT SELECTED TEST
        000001                    SW00=1                 ;RESELECT DV11 DESIRED ACTIVE
                                                         ;NOTE: THIS MUST NOT EXCEED ORIGINAL COUNT
```

```


                          ;REGISTER DEFINITIONS
                          ;---------------------

        000000            R0=%0            ;GENERAL REGISTER
        000001            R1=%1            ;GENERAL REGISTER
        000002            R2=%2            ;GENERAL REGISTER
        000003            R3=%3            ;GENERAL REGISTER
        000004            R4=%4            ;GENERAL REGISTER
        000005            R5=%5            ;GENERAL REGISTER
        000006            SP=%6            ;PROCESSOR STACK POINTER
        000007            PC=%7            ;PROGRAM COUNTER

                          ;LOCATION EQUIVALENCIES
                          ;----------------------

        177776            PS=177776        ;PROCESSOR STATUS WORD
        001200            STACK=1200       ;START OF PROCESSOR STACK

        100000            BIT15=100000
        040000            BIT14=40000
        020000            BIT13=20000
        010000            BIT12=10000
        004000            BIT11=4000
        002000            BIT10=2000
        001000            BIT9=1000
        000400            BIT8=400
        000200            BIT7=200
        000100            BIT6=100
        000040            BIT5=40
        000020            BIT4=20
        000010            BIT3=10
        000004            BIT2=4
        000002            BIT1=2
        000001            BIT0=1
                          ;---------------------------------
        010000            ALU=BIT12
        020000            RAM=BIT13
        030000            XFR=BIT13+BIT12
        040000            NPR=BIT14
        050000            S.C=BIT14+BIT12
        060000            BCC=BIT14+BIT13
        070000            BRB=BIT14+BIT13+BIT12
                          ;---------------------------------


```

```
                                 ;;*******************************************************************
                                 ;------------------------------------------------------------------
                                           ;TRAPCATCAER FOR ILLEGAL INTERRUPTS
                                           ;THE STANDARD ''TRAP CATCHER'' IS PLACED
                                           ;BETWEEN ADDRESS 0 TO ADDRESS 776.
                                           ;IT LOOKS LIKE 'PC+2 HALT''.
                                 ;------------------------------------------------------------------
                                 ;;*******************************************************************

        000000                   .=0
                                           ;STANDARD INTERRUPT VECTORS
                                           ;--------------------------

        000024                   .=24
000024  004402                             .PFAIL                      ;POWER FAIL HANDLER
000026  000340                             340                         ;SERVICE AT LEVEL 7
000030  004002                             .HLT                        ;ERROR HANDLER
000032  000340                             340                         ;SERVICE AT LEVEL 7
000034  003750                             .TRPSRV                     ;GENERAL HANDLER DISPATCH SERVICE
000036  000340                             340                         ;SERVICE AT LEVEL 7
        000040                   .=40
000040  000001                             .BLKW 1                     ;SAVE FOR ACT-11 OR DDP2
000042  000001                             .BLKW 1                     ;RETURN ADDRESS IF UNDER ACT-11 OR DDP2
000044  000001                             .BLKW 1                     ;SAVE FOR ACT-11 OR DDP2
000046  002560                             LOGICAL                     ;FOR USE WITH ACT-11 OR DDP2

        000174                   .=174
000174  000000                   LIGHT:    0
        000176                   .=176
000176  000000                   SSWR:     0

        000200                   .=200
000200  000137  001742                     JMP     .START              ;GO TO START OF PROGRAM


        001000                   .=1000
001000  005377  041501  034055   MTITLE: .ASCIZ  <377><12>/AC-8744C-MC/<377>/CZDVECO DV11 MODEM CNTRL/<377>

        001200                   .=1200
001200                           LIGHTS:
001200  177570                             177570
001202  177570                   SWR:      177570
                                           ;INDIRECT POINTERS TO TELETYPE VECTORS AND REGISTERS
                                           ;--------------------------------------------------

001204  177560                   TKCSR:    177560                      ;TELETYPE KEYBOARD CONTROL REGISTER
001206  177562                   TKDBR:    177562                      ;TELETYPE KEYBOARD DATA BUFFER
001210  177564                   TPCSR:    177564                      ;TELEPRINTER CONTROL REGISTER
001212  177566                   TPDBR:    177566                      ;TELEPRINTER DATA BUFFER

                                           ;PROGRAM CONTROL PARAMETERS
                                           ;--------------------------

001214  000000                   RETURN:   0                           ;SCOPE ADDRESS FOR LOOP ON TEST
001216  000000                   NEXT:     0                           ;ADDRESS OF NEXT TEST TO BE EXECUTED
001220  000000                   LOCK:     0                           ;ADDRESS FOR LOCK ON CURRENT DATA
```

```
001222  000003          ICOUNT: 3                       ;NUMBER OF ITERATIONS THAT CURRENT TEST WILL BE EXECUTED
001224  000000          LPCNT:  0                       ;NUMBER OF ITEREATIONS COMPLETED
001226  000000          TSTNO:  0                       ;NUMBER OF TEST IN PROGRESS
001230  000000          PASCNT: 0                       ;NUMBER OF PASSES COMPLETED
001232  000000          ERRCNT: 0                       ;TOTAL NUMBER OF ERRORS
001234  000000          LSTERR: 0                       ;PC OF LAST ERROR CALL

                                ;PROGRAM VARIABLES
                                ;-----------------

001236  000000          STAT:   0                       ;DV STATUS WORD STORAGE
001240  000000          SYNCX:  0
001242  000000          CLKX:   0
001244  000000          MASKX:  0
001246  000000          TEMP1:  0                       ;TEMPORARY STORAGE
001250  000000          TEMP2:  0                       ;TEMPORARY STORAGE
001252  000000          TEMP3:  0                       ;TEMPORARY STORAGE
001254  000000          TEMP4:  0                       ;TEMPORARY STORAGE
001256  000000          TEMP5:  0                       ;TEMPORARY STORAGE
001260  000000          SAVR0:  0                       ;R0 STORAGE
001262  000000          SAVR1:  0                       ;R1 STORAGE
001264  000000          SAVR2:  0                       ;R2 STORAGE
001266  000000          SAVR3:  0                       ;R3 STORAGE
001270  000000          SAVR4:  0                       ;R4 STORAGE
001272  000000          SAVR5:  0                       ;R5 STORAGE
001274  000000          SAVSP:  0                       ;STACK POINTER STORAGE
001276  000000          SAVPC:  0                       ;PROGRAM COUNTER STORAGE
001300  000001          DVACTV: .BLKB 1                 ;DV11'S SELECTED ACTIVE.
001301  000001          DVNUM:  .BLKB 1                 ;OCTAL NUMBER OF DV11'S.
001302  000001          SAVACT: .BLKB 1                 ;ORIGINAL ACTV.  DEVICES.
001303  000001          SAVNUM: .BLKB 1                 ;WORKABLE NUMBER.
001304  000001          RUN:    .BLKB 1                 ;POINTER ONE PAST RUNNING DEVICE.
        001306          .EVEN
001306  001500          CREAM:  DV.MAP                  ;TABLE POINTER.
```

```

                                                    ;PROGRAM CONTROL FLAGS
                                                    ;---------------------

     001310        000              INIFLG: .BYTE   0                   ;PROGRAM INITIALIZATION FLAG
     001311        000              ERRFLG: .BYTE   0                   ;ERROR OCCURED FLAG
     001312        000              LOKFLG: .BYTE   0                   ;LOCK ON CURRENT TEST FLAG
     001313        000              QV.FLG: .BYTE   0                   ;QUICK VERIFY FLAG.
                                                                        ;ON FIRST PASS OF EACH DV11 ITERATIONS WILL BE SUPPRESSE
                                    .EVEN
                000000              $Y=0

                                                    ;DEFINITIONS FOR TRAP SUBROUTINE CALLS
                                                    ;POINTERS TO SUBROUTINES CAN BE FOUND
                                                    ;IN THE TABLE IMMEDIATLY FOLLOWING THE DEFINITIONS

                                    ;:*********************************************************************
                                    ;---------------------------------------------------------------------
     001314                         .TRPTAB:
                104400              SCOPE=TRAP+0            ;CALL TO SCOPE LOOP AND ITERATION HANDLER
     001314     002634                      .SCOPE
                104401              SCOP1=TRAP+1            ;CALL TO LOOP ON CURRENT DATA HANDLER
     001316     003020                      .SCOP1
                104402              TYPE=TRAP+2             ;CALL TO TELETYPE OUTPUT ROUTINE
     001320     003044                      .TYPE
                104403              INSTR=TRAP+3            ;CALL TO ASCII STRING INPUT ROUTINE
     001322     003120                      .INSTR
                104404              INSTER=TRAP+4           ;CALL TO INPUT ERROR HANDLER
     001324     003224                      .INSTER
                104405              PARAM=TRAP+5            ;CALL TO NUMERICAL DATA INPUT ROUTINE
     001326     003244                      .PARAM
                104406              SAV05=TRAP+6            ;CALL TO REGISTER SAVE ROUTINE
     001330     003444                      .SAV05
                104407              RES05=TRAP+7            ;CALL TO REGISTER RESTORE ROUTINE
     001332     003504                      .RES05
                104410              CONVRT=TRAP+10          ;CALL TO DATA OUTPUT ROUTINE
     001334     003536                      .CONVRT
                104411              CNVRT=TRAP+11           ;CALL TO DATA OUTPUT ROUNTINE WITHOUT CR/LF.
     001336     003542                      .CNVRT
                104412              MSTCLR=TRAP+12          ;CALL TO ISUE A MASTER CLEAR
     001340     004556                      .MSTCLR
                104413              RAMCLR=TRAP+13          ;CALL TO CLEAR THE RAMS
     001342     004516                      .RAMCLR
                104414              DELAY=TRAP+14           ;CALL TO VARIABLE DELAY COUNTER
     001344     004476                      .DELAY
                104415              ROMCLK=TRAP+15          ;CALL TO CLOCK ROM ONCE
     001346     004566                      .ROMCLK
                104416              DATACLK=TRAP+16         ;CALL TO CLK DATA
     001350     004576                      .DATACLK


                                    ;---------------------------------------------------------------------
                                    ;:*********************************************************************
```

```
                                          ;DV11 VECTOR AND REGISTER INDIRECT POINTERS

001352  000000          DVRVEC: 0                       ;POINTER TO DV11 RECEIVER INTERRUPT VECTOR
001354  000000          DVRLVL: 0                       ;POINTER TO DV11 RECEIVER INTERRUPT SERVICE PS
001356  000000          DVTVEC: 0                       ;POINTER TO DV11 TRANSMITTER INTERRUPT VECTOR
001360  000000          DVTLVL: 0                       ;POINTER TO DV11 TRANSMITTER INTERRUPT SERVICE PS
001362  000000          DVSCR:  0                       ;POINTER TO DV11 SYSTEM CONTROL REGISTER
001364  000000          DVSCRH: 0                       ;POINTER TO DV11 SYSTEM CONTROL REGISTER HIGH BYTE.
001366  000000          DVRIC:  0                       ;POINTER TO DV11 NEXT RECEIVED CHARACTER REGISTER
001370  000000          DVLCR:  0                       ;POINTER TO DV11 LINE PRAMETER REGISTER
001372  000000          DVSRS:  0                       ;POINTER TO DV11 SECONDARY REGISTER SELECT REGISTER
001374  000000          DVSRSH: 0                       ;POINTER TO DV11 SECONDARY REGISTER SELECT HIGH BYTE.
001376  000000          DVSRA:  0                       ;POINTER TO DV11 SECONDARY REGISTER ACCESS REGISTER
001400  000000          DVSFR:  0                       ;POINTER TO DV11 SPECIAL FUNCTIONS REGISTER
001402  000000          DVNSR:  0                       ;POINTER TO DV11 NPR STATUS REGISTER
001404  000000          RESV16: 0                       ;POINTER TO RESERVED REGISTER.



                                ;DV11 CONTROL INDICATORS FOR CURRENT DV11 UNDER TEST
                                ;---------------------------------------------------

001406  000000          MASK.A: .WORD 000               ;LAST CHAR TO TEST AND PARITY MASK FOR LINES 00-03
001410  000000          MASK.B: .WORD 000               ;LAST CHAR TO TEST AND PARITY MASK FOR LINES 04-07
001412  000000          MASK.C: .WORD 000               ;LAST CHAR TO TEST AND PARITY MASK FOR LINES 08-11
001414  000000          MASK.D: .WORD 000               ;LAST CHAR TO TEST AND PARITY MASK FOR LINES 12-15

001416     010          CLK.A:  .BYTE 8.                ;NUMBER OF CLOCKS NEEDED FOR ONE CHAR FOR LINES 00-03
001417     010          CLK.B:  .BYTE 8.                ;NUMBER OF CLOCKS NEEDED FOR ONE CHAR FOR LINES 04-07
001420     010          CLK.C:  .BYTE 8.                ;NUMBER OF CLOCKS NEEDED FOR ONE CHAR FOR LINES 08-11
001421     010          CLK.D:  .BYTE 8.                ;NUMBER OF CLOCKS NEEDED FOR ONE CHAR FOR LINES 12-15

001422  000000          L00.03: 000000                  ;PARAMETERS FOR LINES 00-03
001424  000000          L04.07: 000000                  ;PARAMETERS FOR LINES 04-07
001426  000000          L08.11: 000000                  ;PARAMETERS FOR LINES 08-11
001430  000000          L12.15: 000000                  ;PARAMETERS FOR LINES 12-15

001432  000000          SYNC2A: 000000                  ;SYNC 2
001434  000000          SYNC2B: 000000                  ;
001436  000000          SYNC2C: 000000                  ;
001440  000000          SYNC2D: 000000                  ;


                                        ;SUMMARY
                                        ;-------
                        ;       MASK.X          040     5 BITS PER CHAR.
                        ;                       100     6 BITS PER CHAR.
                        ;                       200     7 BITS PER CHAR.
                        ;                       400     8 BITS PER CHAR.

                        ;       CLK.X           005     5 BITS PER CHAR.
                        ;                       006     6 BITS PER CHAR.
                        ;                       007     7 BITS PER CHAR.
                        ;                       010     8 BITS PER CHAR.
                        ;       IF PARITY IS ENABLED; ADD PLUS ONE TO THE ABOVE ''CLK.X''
                        ;       FOR EACH GROUP THAT PARITY IS ENABLED.
```

```
                                  ;DV11 STATUS TABLE AND ADDRESS ASSIGNMENTS
                                  ;-----------------------------------------

                 001500     .=1500
        001500              DV.MAP:
        001500   000001     DVCR00: .BLKW 1          ;CONTROL STATUS REGISTER FOR DV11 NUMBER 00
        001502   000001     DVTR00: .BLKW 1          ;VECTOR ''A'' FOR DV11 NUMBER 00
        001504   000001     DV00.A: .BLKW 1          ;PARAMETER FOR LINES 00-03 FOR DV11 NUMBER 00
        001506   000001     SYNA00: .BLKW 1          ;SYNC TWO
        001510   000001     DV00.B: .BLKW 1          ;PARAMETER FOR LINES 04-07 FOR DV11 NUMBER 00
        001512   000001     SYNB00: .BLKW 1          ;SYNC TWO
        001514   000001     DV00.C: .BLKW 1          ;PARAMETER FOR LINES 08-11 FOR DV11 NUMBER 00
        001516   000001     SYNC00: .BLKW 1          ;SYNC TWO
        001520   000001     DV00.D: .BLKW 1          ;PARAMETER FOR LINES 12-15 FOR DV11 NUMBER 00
        001522   000001     SYND00: .BLKW 1          ;SYNC TWO

        001524   000001     DVCR01: .BLKW 1          ;CONTROL STATUS REGISTER FOR DV11 NUMBER 01
        001526   000001     DVTR01: .BLKW 1          ;VECTOR ''A'' FOR DV11 NUMBER 01
        001530   000001     DV01.A: .BLKW 1          ;PARAMETER FOR LINES 00-03 FOR DV11 NUMBER 01
        001532   000001     SYNA01: .BLKW 1          ;SYNC TWO
        001534   000001     DV01.B: .BLKW 1          ;PARAMETER FOR LINES 04-07 FOR DV11 NUMBER 01
        001536   000001     SYNB01: .BLKW 1          ;SYNC TWO
        001540   000001     DV01.C: .BLKW 1          ;PARAMETER FOR LINES 08-11 FOR DV11 NUMBER 01
        001542   000001     SYNC01: .BLKW 1          ;SYNC TWO
        001544   000001     DV01.D: .BLKW 1          ;PARAMETER FOR LINES 12-15 FOR DV11 NUMBER 01
        001546   000001     SYND01: .BLKW 1          ;SYNC TWO

        001550   000001     DVCR02: .BLKW 1          ;CONTROL STATUS REGISTER FOR DV11 NUMBER 02
        001552   000001     DVTR02: .BLKW 1          ;VECTOR ''A'' FOR DV11 NUMBER 02
        001554   000001     DV02.A: .BLKW 1          ;PARAMETER FOR LINES 00-03 FOR DV11 NUMBER 02
        001556   000001     SYNA02: .BLKW 1          ;SYNC TWO
        001560   000001     DV02.B: .BLKW 1          ;PARAMETER FOR LINES 04-07 FOR DV11 NUMBER 02
        001562   000001     SYNB02: .BLKW 1          ;SYNC TWO
        001564   000001     DV02.C: .BLKW 1          ;PARAMETER FOR LINES 08-11 FOR DV11 NUMBER 02
        001566   000001     SYNC02: .BLKW 1          ;SYNC TWO
        001570   000001     DV02.D: .BLKW 1          ;PARAMETER FOR LINES 12-15 FOR DV11 NUMBER 02
        001572   000001     SYND02: .BLKW 1          ;SYNC TWO

        001574   000001     DVCR03: .BLKW 1          ;CONTROL STATUS REGISTER FOR DV11 NUMBER 03
        001576   000001     DVTR03: .BLKW 1          ;VECTOR ''A'' FOR DV11 NUMBER 03
        001600   000001     DV03.A: .BLKW 1          ;PARAMETER FOR LINES 00-03 FOR DV11 NUMBER 03
        001602   000001     SYNA03: .BLKW 1          ;SYNC TWO
        001604   000001     DV03.B: .BLKW 1          ;PARAMETER FOR LINES 04-07 FOR DV11 NUMBER 03
        001606   000001     SYNB03: .BLKW 1          ;SYNC TWO
        001610   000001     DV03.C: .BLKW 1          ;PARAMETER FOR LINES 08-11 FOR DV11 NUMBER 03
        001612   000001     SYNC03: .BLKW 1          ;SYNC TWO
        001614   000001     DV03.D: .BLKW 1          ;PARAMETER FOR LINES 12-15 FOR DV11 NUMBER 03
        001616   000001     SYND03: .BLKW 1          ;SYNC TWO

        001620   000001     DVCR04: .BLKW 1          ;CONTROL STATUS REGISTER FOR DV11 NUMBER 04
        001622   000001     DVTR04: .BLKW 1          ;VECTOR ''A'' FOR DV11 NUMBER 04
        001624   000001     DV04.A: .BLKW 1          ;PARAMETER FOR LINES 00-03 FOR DV11 NUMBER 04
        001626   000001     SYNA04: .BLKW 1          ;SYNC TWO
        001630   000001     DV04.B: .BLKW 1          ;PARAMETER FOR LINES 04-07 FOR DV11 NUMBER 04
        001632   000001     SYNB04: .BLKW 1          ;SYNC TWO
        001634   000001     DV04.C: .BLKW 1          ;PARAMETER FOR LINES 08-11 FOR DV11 NUMBER 04
```

```
001636  000001                      SYNC04: .BLKW 1           ;SYNC TWO
001640  000001                      DV04.D: .BLKW 1           ;PARAMETER FOR LINES 12-15 FOR DV11 NUMBER 04
001642  000001                      SYND04: .BLKW 1           ;SYNC TWO

001644  000001                      DVCR05: .BLKW 1           ;CONTROL STATUS REGISTER FOR DV11 NUMBER 05
001646  000001                      DVTR05: .BLKW 1           ;VECTOR "A" FOR DV11 NUMBER 05
001650  000001                      DV05.A: .BLKW 1           ;PARAMETER FOR LINES 00-03 FOR DV11 NUMBER 05
001652  000001                      SYNA05: .BLKW 1           ;SYNC TWO
001654  000001                      DV05.B: .BLKW 1           ;PARAMETER FOR LINES 04-07 FOR DV11 NUMBER 05
001656  000001                      SYNB05: .BLKW 1           ;SYNC TWO
001660  000001                      DV05.C: .BLKW 1           ;PARAMETER FOR LINES 08-11 FOR DV11 NUMBER 05
001662  000001                      SYNC05: .BLKW 1           ;SYNC TWO
001664  000001                      DV05.D: .BLKW 1           ;PARAMETER FOR LINES 12-15 FOR DV11 NUMBER 05
001666  000001                      SYND05: .BLKW 1           ;SYNC TWO

001670  000001                      DVCR06: .BLKW 1           ;CONTROL STATUS REGISTER FOR DV11 NUMBER 06
001672  000001                      DVTR06: .BLKW 1           ;VECTOR "A" FOR DV11 NUMBER 06
001674  000001                      DV06.A: .BLKW 1           ;PARAMETER FOR LINES 00-03 FOR DV11 NUMBER 06
001676  000001                      SYNA06: .BLKW 1           ;SYNC TWO
001700  000001                      DV06.B: .BLKW 1           ;PARAMETER FOR LINES 04-07 FOR DV11 NUMBER 06
001702  000001                      SYNB06: .BLKW 1           ;SYNC TWO
001704  000001                      DV06.C: .BLKW 1           ;PARAMETER FOR LINES 08-11 FOR DV11 NUMBER 06
001706  000001                      SYNC06: .BLKW 1           ;SYNC TWO
001710  000001                      DV06.D: .BLKW 1           ;PARAMETER FOR LINES 12-15 FOR DV11 NUMBER 06
001712  000001                      SYND06: .BLKW 1           ;SYNC TWO

001714  000001                      DVCR07: .BLKW 1           ;CONTROL STATUS REGISTER FOR DV11 NUMBER 07
001716  000001                      DVTR07: .BLKW 1           ;VECTOR "A" FOR DV11 NUMBER 07
001720  000001                      DV07.A: .BLKW 1           ;PARAMETER FOR LINES 00-03 FOR DV11 NUMBER 07
001722  000001                      SYNA07: .BLKW 1           ;SYNC TWO
001724  000001                      DV07.B: .BLKW 1           ;PARAMETER FOR LINES 04-07 FOR DV11 NUMBER 07
001726  000001                      SYNB07: .BLKW 1           ;SYNC TWO
001730  000001                      DV07.C: .BLKW 1           ;PARAMETER FOR LINES 08-11 FOR DV11 NUMBER 07
001732  000001                      SYNC07: .BLKW 1           ;SYNC TWO
001734  000001                      DV07.D: .BLKW 1           ;PARAMETER FOR LINES 12-15 FOR DV11 NUMBER 07
001736  000001                      SYND07: .BLKW 1           ;SYNC TWO

001740  000000                      DV.END: 000000

                                            ;PROGRAM INITIALIZATION
                                            ;LOCK OUT INTERRUPTS
                                            ;SET UP PROCESSOR STACK
                                            ;SET UP POWER FAIL VECTOR
                                            ;CLEAR PROGRAM CONTROL FLAGS AND COUNTS
                                            ;TYPE TITLE MESSAGE

001742  012737  000340  177776      .START: MOV     #340,PS             ;LOCK OUT INTERRUPTS
001750  012706  001200                      MOV     #STACK,SP           ;SET UP STACK
001754  012737  004402  000024              MOV     #.PFAIL,@#24        ;SET UP POWER FAIL VECTOR
001762  113737  001301  001303              MOVB    DVNUM,SAVNUM        ;SAVE NUMBER OF DEVICES IN SYSTEM.
001770  005037  001230                      CLR     PASCNT              ;CLEAR PASS COUNT
001774  105037  001311                      CLRB    ERRFLG              ;CLEAR ERROR FLAG
002000  105037  001313                      CLRB    QV.FLG              ;ZERO QUICK VERIFY FLAG
002004  012737  001500  001306              MOV     #DV.MAP,CREAM       ;GET MAP POINTER.
002012  112737  000001  001304              MOVB    #1,RUN              ;POINT POINTER TO FIRST DEVICE.
002020  005037  001232                      CLR     ERRCNT              ;CLEAR ERROR COUNT
```

```
002024  005037  001234                   CLR     LSTERR                  ;CLEAR LAST ERROR POINTER
002030  012737  000001  001226           MOV     #1,TSTNO                ;SET UP FOR TEST 1
002036  012737  001742  001214           MOV     #.START,RETURN          ;SET UP FOR POWER FAIL BEFORE
                                                                         ;TESTING STARTS
002044  105737  001310                   TSTB    INIFLG                  ;HAS INITIALIZATION BEEN PERFORMED
002050  001063                           BNE     1$                      ;BR IF YES
002052  013746  000004                   MOV     4,-(SP)                 ;
002056  013746  000006                   MOV     6,-(SP)                 ;
002062  005037  000006                   CLR     6                       ;
002066  012737  002104  000004           MOV     #80$,4                  ;
002074  005777  177102                   TST     @SWR                    ;
002100  000240                           NOP                             ;
002102  000407                           BR      81$                     ;
002104  022626                   80$:    CMP     (SP)+,(SP)+             ;
002106  012737  000174  001200           MOV     #LIGHT,LIGHTS           ;
002114  012737  000176  001202           MOV     #SSWR,SWR               ;
002122  012637  000006           81$:    MOV     (SP)+,6                 ;
002126  012637  000004                   MOV     (SP)+,4                 ;
002132  104402  001000                   TYPE    ,MTITLE                 ;TYPE TITLE MESSAGE
002136  105137  001310                   COMB    INIFLG                  ;IF NOT SET FLAG AND DO
002142  105777  177034                   TSTB    @SWR                    ;BIT7=1??
002146  100402                           BMI     16$                     ;BR IF NO AUTO SIZE
002150  004737  006626                   JSR     PC,CSRMAP               ;GO DO THE AUTO SIZE
002154  104402  005461           16$:    TYPE    ,XHEAD          ;TYPE HEADER
002160  012737  001500  001246           MOV     #DV.MAP,TEMP1           ;SET POINTER
002166  017737  177054  001250   5$:     MOV     @TEMP1,TEMP2            ;SET DATA
002174  022737  177777  001250           CMP     #177777,TEMP2           ;ALL DONE?
002202  001406                           BEQ     1$                      ;BR IF YES
002204  104410                           CONVRT                          ;
002206  005506                           XSTATQ                          ;
002210  062737  000002  001246           ADD     #2,TEMP1                ;UPDATE POINTER
002216  000763                           BR      5$
002220  005737  000042           1$:     TST     @#42                    ;IS PROGRAM RUNNING UNDER MONITOR
002224  001030                           BNE     3$                      ;BR IF YES
002226  032777  000001  176746           BIT     #SW00,@SWR              ;SELECT SPECIFIC DEVICES??
002234  001424                           BEQ     3$                      ;BR IF NO.
002236  104402  005402                   TYPE    ,MNEW                   ;TYPE THE MESSAGE.
002242  005000                           CLR     R0                      ;ZERO DATA LIGHTS
002244  000000                           HALT                            ;WAIT FOR USER TO TELL WHAT DEVICES TO RUN
002246  127737  176730  001302           CMPB    @SWR,SAVACT             ;IS THE NUMBER VALID?
002254  101404                           BLOS    2$                      ;BR IF NUMBER IS OK.
002256  104402  005243                   TYPE    ,MERR3                  ;TELL USER OF INVALID NUMBER.
002262  000000                           HALT                            ;STOP EVERY THING.
002264  000776                           BR      .-2                     ;RESTART THE PROGRAM AGAIN.
002266  117737  176710  001300   2$:     MOVB    @SWR,DVACTV             ;GET NEW DEVICE PATTERN
002274  113700  001300                   MOVB    DVACTV,R0               ;SHOW THE USER WHAT HE SELECTED.
002300  042700  177400                   BIC     #^C<377>,R0             ;USE ONLY LOW BYTE.
002304  000000                           HALT                            ;CONTINUE DYNAMIC SWITCHES.
002306  012700  000300           3$:     MOV     #300,R0                 ;PREPARE TO CLEAR THE FLOATING
002312  012701  000302                   MOV     #302,R1                 ;VECTOR AREA. 300-776
002316  010120                   4$:     MOV     R1,(R0)+                ;START PUTTING 'PC+2 - HALT''
002320  005021                           CLR     (R1)+                   ;IN VECTOR AREA.
002322  022021                           CMP     (R0)+,(R1)+             ;POP POINTERS
002324  022700  001000                   CMP     #1000,R0                ;ALL DONE??
002330  001372                           BNE     4$                      ;BR IF NO.
```

```
                                                     ;TEST START AND RESTART
                                                     ;----------------------

002332  012737  000340  177776  .BEGIN: MOV     #340,PS                 ;LOCK OUT INTERRUPTS
002340  012706  001200                  MOV     #STACK,SP               ;SET UP STACK
002344  005737  000042                  TST     @#42                    ;IS PROGRAM UNDER MONITOR CONTROL
002350  001023                          BNE     3$                      ;BR IF YES
002352  032777  000004  176622          BIT     #BIT2,@SWR              ;CHECK FOR LOCK ON TEST
002360  001411                          BEQ     1$                      ;BR IF NO LOCK DESIRED.
002362  104402  005301                  TYPE    ,MLOCK                  ;TYPE LOCK SELECTED.
002366  012737  000240  002702          MOV     #NOP,TTST               ;ADJUST SCOPE ROUTINE.
002374  012737  000240  002704          MOV     #NOP,TTST+2             ;SET UP TO LOCK
002402  000406                          BR      2$                      ;CONTINUE ALONG.
002404  013737  003014  002702  1$:     MOV     BRW,TTST                ;PREPARE NORMAL SCOPE ROUTINE
002412  013737  003016  002704          MOV     BRX,TTST+2              ;LOCK NOT SELECTED, SET UP FOR NORMAL SCOPE LOOP
002420                          2$:
002420  012737  005666  001214  3$:     MOV     #CYCLE,RETURN           ;START AT ''CYCLE'' FIND WHICH DEVICE TO TEST
002426  104402  005171          4$:     TYPE    ,MR                     ;TYPE R
002432  000177  176556                  JMP     @RETURN                 ;START TESTING
```

```
                                                  ;END OF PASS
                                                  ;TYPE NAME OF TEST
                                                  ;UPDATE PASS COUNT
                                                  ;CHECK FOR EXIT TO ACT-11
                                                  ;RESTART TEST

002436  000005                          .EOP:     RESET                        ;MAKE THE  WORLD CLEAN AGAIN.
002440  005037  001234                            CLR     LSTERR               ;CLEAR LAST ERROR PC
002444  105037  001311                            CLRB    ERRFLG               ;CLEAR ERROR FLAG
002450  005237  001230                            INC     PASCNT               ;UPDATE PASS COUNT
002454  013777  001230  176516                    MOV     PASCNT,@LIGHTS       ;DISPLAY PASS COUNT
002462  104402  005145                            TYPE    ,MEPASS              ;TYPE END PASS
002466  104402  005330                            TYPE    ,MCSRX               ;TYPE CSR
002472  104411  002604                            CNVRT   ,XCSR                ;SHOW IT
002476  104402  005336                            TYPE    ,MVECX               ;TYPE VECTOR
002502  104411  002612                            CNVRT   ,XVEC                ;SHOW IT
002506  104402  005344                            TYPE    ,MPASSX              ;TYPE PASSES
002512  104411  002620                            CNVRT   ,XPASS               ;SHOW IT
002516  104402  005355                            TYPE    ,MERRX               ;TYPE ERRORS
002522  104411  002626                            CNVRT   ,XERR                ;SHOW IT
002526  105337  001303                            DECB    SAVNUM               ;ARE ALL DEVICES TESTED?
002532  001017                                    BNE     RESTRT               ;BR IF NO.
002534  112737  000377  001313                    MOVB    #377,QV.FLG          ;SET THE QUICK VERIFY FLAG.
002542  113737  001301  001303                    MOVB    DVNUM,SAVNUM         ;RESTORE THE COUNT
002550  013701  000042                            MOV     @#42,R1              ;CHECK FOR ACT-11 OR DDP
002554  001406                                    BEQ     RESTRT               ;IF NOT, CONTINUE TESTING
002556  000005                                    RESET                        ;STOP THE SHOW--CLEAR THE WORLD
002560                                  LOGICAL:
002560  004711                                    JSR     PC,(R1)
002562  000240                                    NOP
002564  000240                                    NOP
002566  000240                                    NOP
002570  000240                                    NOP
002572  012737  005666  001214          RESTRT:   MOV     #CYCLE,RETURN
002600  000137  005666                            JMP     CYCLE
002604  000001                          XCSR:     1
002606     006     002                            .BYTE   6,2
002610  001362                                    DVSCR
002612  000001                          XVEC:     1
002614     003     002                            .BYTE   3,2
002616  001352                                    DVRVEC
002620  000001                          XPASS:    1
002622     006     002                            .BYTE   6,2
002624  001230                                    PASCNT
002626  000001                          XERR:     1
002630     006     002                            .BYTE   6,2
002632  001232                                    ERRCNT

                                                  ;SCOPE LOOP AND INTERATION HANDLER
                                                  ;----------------------------------

002634                                  .SCOPE:
002634  022737  177570  001202                    CMP     #177570,SWR          ;IS THERE A REAL SWR?
002642  001411                                    BEQ     64$                  ;BR IF YES
002644  017746  176336                            MOV     @TKDBR,-(SP)         ;SAVE KEYBOARD CHAR
002650  042716  000200                            BIC     #BIT7,(SP)           ;CLEAR PARITY BIT
```

```
002654  122726  000007                   CMPB    #7,(SP)+         ;WAS IT CNTRL 'G' ?
002660  001002                           BNE     .+6              ;BR IF NO.
002662  004737  004640                   JSR     PC,SERV.G        ;SERVICE ''CNTRL 'G'''.
002666  005037  001234           64$:    CLR     LSTERR           ;CLEAR LAST ERROR PC.
002672  010016                           MOV     R0,(SP)          ;SAVE R0 ON THE STACK
002674  032777  040000  176300           BIT     #BIT14,@SWR      ;''LOOP ON THIS TEST''?
002702  001407                   TTST:   BEQ     1$               ;BR IF NO.  (IF LOCK SW01=1; THIS LOC =240)
002704  000437                           BR      3$               ;GOTO 3$    (IF LOCK SW01=1; THIS LOC =240)
002706  105777  176272                   TSTB    @TKCSR           ;KEYBOAD DONE?
002712  100034                           BPL     3$               ;BR IF NO. (LOCK: HIT KEY TO GOTO NEXT TEST)
002714  017700  176266                   MOV     @TKDBR,R0        ;CLEAR DONE BIT
002720  000415                           BR      2$               ;CONTINUE
002722  032777  004000  176252   1$:     BIT     #SW11,@SWR       ;DELETE ITERATION?  (QUICK PASS)
002730  001011                           BNE     2$               ;BR IF YES
002732  105737  001313                   TSTB    QV.FLG           ;HAVE PASSES BEECOMPLETED?
002736  001406                           BEQ     2$               ;BR IF QUICK PASS.
002740  005237  001224                   INC     LPCNT            ;UPDATE ITERATION COUNTER
002744  023737  001224  001222           CMP     LPCNT,ICOUNT     ;ARE ALL ITERATIONS DONE??
002752  001014                           BNE     3$               ;BR IF NOT YET
002754  105037  001311           2$:     CLRB    ERRFLG           ;PREPARE FOR NEW TEST
002760  005037  001224                   CLR     LPCNT            ;START ICOUNTER AT 0
002764  005037  001220                   CLR     LOCK
002770  012737  000005  001222           MOV     #5.,ICOUNT       ;RESET ITERATIONS
002776  013737  001216  001214           MOV     NEXT,RETURN      ;GET NEXT TEST
003004  011600                   3$:     MOV     (SP),R0          ;POP R0 OFF OF THE STACK
003006  022626                           POP2SP                   ;FAKE AN ''RTI''
003010  000177  176200                   JMP     @RETURN          ;GO DO THE TEST
003014  001407                   BRW:    1407
003016  000437                   BRX:    437

                                         ;CHECK FOR FREEZE ON CURRENT DATA
                                         ;--------------------------------

003020  032777  001000  176154   .SCOP1: BIT     #SW09,@SWR       ;IS SW09=1(SET)?
003026  001405                           BEQ     1$               ;BR IF NOT SET.
003030  005737  001220                   TST     LOCK
003034  001402                           BEQ     1$
003036  013716  001220                   MOV     LOCK,(SP)        ;GOTO THE ADDRESS IN LOCK.
003042  000002                   1$:     RTI                      ;GO BACK.

                                         ;TELETYPE OUTPUT ROUTINE
                                         ;----------------------

003044  010546                   .TYPE:  MOV     R5,-(SP)         ;SAVE R5 ON THE STACK.
003046  017605  000002                   MOV     @2(SP),R5        ;GET ADDRESS OF MESSAGE.
003052  062766  000002  000002           ADD     #2,2(SP)         ;POP OVER ADDRESS.
003060  032777  010000  176114   1$:     BIT     #SW12,@SWR       ;INHIBIT ALL PRINT OUT??
003066  001012                           BNE     3$               ;BR IF NO PRINT OUT WANTED (SW12=1)
003070  105715                           TSTB    (R5)             ;IS NUMBER MINUS? (MSB=1(BIT7))
003072  100002                           BPL     2$               ;BR IF NUMBER IS PLUS
003074  104402  005104                   TYPE    ,MCRLF           ;TYPE A CR/LF!
003100  105777  176104           2$:     TSTB    @TPCSR           ;TTY READY?
003104  100375                           BPL     2$               ;BR IF NO.
003106  112577  176100                   MOVB    (R5)+,@TPDBR     ;PRINT CURRENT CHAR.
003112  0C1362                           BNE     1$               ;IF NOT ZERO KEEP PRINTING!
003114  012605                   3$:     MOV     (SP)+,R5         ;END OF OUTPUT. RESTORE R5
```

```
003116  000002                            RTI                          ;GO HOME
                                          ;--------------------------

003120  010346                    .INSTR: MOV     R3,-(SP)             ;SAVE R3 ON STACK
003122  010446                            MOV     R4,-(SP)             ;SAVE R4 ON STACK
003124  017637  000004  003142            MOV     @4(SP),.MSG
003132  062766  000002  000004            ADD     #2,4(SP)
003140  104402                    .INST1: TYPE
003142  000000                    .MSG:   0
003144  012704  005520                    MOV     #INBUF,R4
003150  012703  000007                    MOV     #7,R3
003154  105777  176024            1$:     TSTB    @TKCSR
003160  100375                            BPL     1$
003162  117714  176020                    MOVB    @TKDBR,(R4)
003166  142714  000200                    BICB    #200,(R4)
003172  122427  000015                    CMPB    (R4)+,#15
003176  001417                            BEQ     INSTR2
003200  105777  176004            2$:     TSTB    @TPCSR
003204  100375                            BPL     2$
003206  017777  175774  175776            MOV     @TKDBR,@TPDBR
003214  005303                            DEC     R3
003216  001356                            BNE     1$
003220  012604                            MOV     (SP)+,R4
003222  012603                            MOV     (SP)+,R3
003224  104402  005100            .INSTE: TYPE    ,MQM
003230  010346                            MOV     R3,-(SP)
003232  010446                            MOV     R4,-(SP)
003234  000741                            BR      .INST1
003236  012604                    INSTR2: MOV     (SP)+,R4             ;RESTORE R4
003240  012603                            MOV     (SP)+,R3             ;RESTORE R3
003242  000002                            RTI


                                          ;CONVERT ASCII STRING TO OCTAL
                                          ;------------------------------

003244  010546                    .PARAM: MOV     R5,-(SP)
003246  010446                            MOV     R4,-(SP)
003250  016605  000004                    MOV     4(SP),R5
003254  012537  003434                    MOV     (R5)+,LOLIM
003260  012537  003436                    MOV     (R5)+,HILIM
003264  012537  003440                    MOV     (R5)+,DEVADR
003270  112537  003442                    MOVB    (R5)+,LOBITS
003274  112537  003443                    MOVB    (R5)+,ADRCNT
003300  010566  000004                    MOV     R5,4(SP)
003304  005005                    PARAM1: CLR     R5
003306  012704  005520                    MOV     #INBUF,R4
003312  122714  000015                    CMPB    #15,(R4)
003316  001420                            BEQ     PARERR
003320  121427  000060            1$:     CMPB    (R4),#60
003324  002415                            BLT     PARERR
003326  121427  000067                    CMPB    (R4),#67
003332  003012                            BGT     PARERR
003334  142714  000060                    BICB    #60,(R4)
003340  152405                            BISB    (R4)+,R5
003342  122714  000015                    CMPB    #15,(R4)
003346  001406                            BEQ     LIMITS
```

```
003350  006305                          ASL     R5
003352  006305                          ASL     R5
003354  006305                          ASL     R5
003356  000760                          BR      1$
003360  104404                  PARERR: INSTER
003362  000750                          BR      PARAM1

                                        ;TEST TO SEE IF NUMBER IS WITHIN LIMITS
                                        ;---------------------------------------

003364  020537  003436          LIMITS: CMP     R5,HILIM
003370  101373                          BHI     PARERR
003372  020537  003434                  CMP     R5,LOLIM
003376  103770                          BLO     PARERR
003400  133705  003442                  BITB    LOBITS,R5
003404  001365                          BNE     PARERR

                                        ;STORE NUMBER AT SPECIFIED ADDRESS

003406  013704  003440                  MOV     DEVADR,R4
003412  010524                  1$:     MOV     R5,(R4)+
003414  062705  000002                  ADD     #2,R5
003420  105337  003443                  DECB    ADRCNT
003424  001372                          BNE     1$
003426  012604                          MOV     (SP)+,R4
003430  012605                          MOV     (SP)+,R5
003432  000002                          RTI
003434  000000                  LOLIM:  0
003436  000000                  HILIM:  0
003440  000000                  DEVADR: 0
003442  000000                  LOBITS: 0
        003443                  ADRCNT=LOBITS+1

                                        ;SAVE PC OF TEST THAT FAILED AND R0-R5
                                        ;-------------------------------------

003444  016637  000004  001276  .SAV05: MOV     4(SP),SAVPC     ;SAVE R7 (PC)

                                        ;SAVE R0-R5

003452  010537  001272          SV05:   MOV     R5,SAVR5        ;SAVE R5
003456  010437  001270                  MOV     R4,SAVR4        ;SAVE R4
003462  010337  001266                  MOV     R3,SAVR3        ;SAVE R3
003466  010237  001264                  MOV     R2,SAVR2        ;SAVE R2
003472  010137  001262                  MOV     R1,SAVR1        ;SAVE R1
003476  010037  001260                  MOV     R0,SAVR0        ;SAVE R0
003502  000002                          RTI                     ;LEAVE.

                                        ;RESTORE R0-R5

003504  013700  001260          .RES05: MOV     SAVR0,R0        ;RESTORE R0
003510  013701  001262                  MOV     SAVR1,R1        ;RESTORE R1
003514  013702  001264                  MOV     SAVR2,R2        ;RESTORE R2
003520  013703  001266                  MOV     SAVR3,R3        ;RESTORE R3
003524  013704  001270                  MOV     SAVR4,R4        ;RESTORE R4
003530  013705  001272                  MOV     SAVR5,R5        ;RESTORE R5
```

```
003534  000002                            RTI                         ;LEAVE

                                          ;CONVERT OCTAL NUMBER TO ASCII AND OUTPUT TO TELEPRINTER
                                          ;-------------------------------------------------------
                                          ;
003536  104402  005104          .CONVR:   TYPE    ,MCRLF
003542  010046                  .CNVRT:   MOV     R0,-(SP)
003544  010146                            MOV     R1,-(SP)
003546  010346                            MOV     R3,-(SP)
003550  010446                            MOV     R4,-(SP)
003552  010546                            MOV     R5,-(SP)
003554  017601  000012                    MOV     @12(SP),R1
003560  062766  000002  000012            ADD     #2,12(SP)
003566  012137  003742                    MOV     (R1)+,WRDCNT
003572  112137  003744          1$:       MOVB    (R1)+,CHRCNT
003576  112137  003745                    MOVB    (R1)+,SPACNT
003602  013137  003746                    MOV     @(R1)+,BINWRD
003606  013704  003746          2$:       MOV     BINWRD,R4
003612  113705  003744                    MOVB    CHRCNT,R5
003616  012700  005562                    MOV     #TEMP,R0
003622  010403                  3$:       MOV     R4,R3
003624  042703  177770                    BIC     #177770,R3
003630  062703  000060                    ADD     #060,R3
003634  110320                            MOVB    R3,(R0)+
003636  000241                            CLC
003640  006004                            ROR     R4
003642  000241                            CLC
003644  006004                            ROR     R4
003646  000241                            CLC
003650  006004                            ROR     R4
003652  005305                            DEC     R5
003654  001362                            BNE     3$
003656  012703  005624                    MOV     #MDATA,R3
003662  114023                  4$:       MOVB    -(R0),(R3)+
003664  105337  003744                    DECB    CHRCNT
003670  001374                            BNE     4$
003672  105737  003745                    TSTB    SPACNT
003676  001405                            BEQ     6$
003700  112723  000040          5$:       MOVB    #040,(R3)+
003704  105337  003745                    DECB    SPACNT
003710  001373                            BNE     5$
003712  105013                  6$:       CLRB    (R3)
003714  104402  005624                    TYPE    ,MDATA
003720  005337  003742                    DEC     WRDCNT
003724  001322                            BNE     1$
003726  012605                            MOV     (SP)+,R5
003730  012604                            MOV     (SP)+,R4
003732  012603                            MOV     (SP)+,R3
003734  012601                            MOV     (SP)+,R1
003736  012600                            MOV     (SP)+,R0
003740  000002                            RTI
003742  000000                  WRDCNT:   0
003744  000000                  CHRCNT:   0
        003745                  SPACNT=CHRCNT+1
003746  000000                  BINWRD:   0
```

```

                                                     ;TRAP DISPATCH SERVICE
                                                     ;ARGUMENT OF TRAP IS EXTRACTED
                                                     ;AND USED AS OFFSET TO OBTAIN POINTER
                                                     ;TO SELECTED SUBROUTINE

003750  011646                           .TRPSR: MOV     (SP),-(SP)               ;GET PC OF RETURN
003752  162716  000002                           SUB     #2,(SP)                  ;=PC OF TRAP
003756  017616  000000                           MOV     @(SP),(SP)               ;GET TRP
003762  006316                           TRPOK:  ASL     (SP)                     ;MULTIPLY TRAP ARG BY 2
003764  042716  177001                           BIC     #177001,(SP)             ;CLEAR UNWANTED BITS
003770  062716  001314                           ADD     #.TRPTAB,(SP)            ;POINTER TO SUBROUTINE ADDRESS
003774  017616  000000                           MOV     @(SP),(SP)               ;SUBROUTINE ADDRESS
004000  000136                                   JMP     @(SP)+                   ;GO TO SUBROUTINE

                                                 ;ERROR HANDLER
                                                 ;-------------


004002                                   .HLT:
004002  022737  177570  001202                   CMP     #177570,SWR      ;IS THERE A REAL SWR?
004010  001411                                   BEQ     64$              ;BR IF YES
004012  017746  175170                           MOV     @TKDBR,-(SP)     ;SAVE KEYBOARD CHAR
004016  042716  000200                           BIC     #BIT7,(SP)       ;CLEAR PARITY BIT
004022  122726  000007                           CMPB    #7,(SP)+         ;WAS IT CNTRL 'G' ?
004026  001002                                   BNE     .+6              ;BR IF NO.
004030  004737  004640                           JSR     PC,SERV.G        ;SERVICE ''CNTRL 'G'''.
004034  032777  010000  175140   64$:            BIT     #SW12,@SWR       ;BELL ON ERROR?
004042  001406                                   BEQ     XBX              ;BR IF NO BELL
004044  105777  175140                           TSTB    @TPCSR           ;TTY READY.
004050  100003                                   BPL     XBX              ;DON'T WAIT IF TTY NOT READY.
004052  112777  000207  175132                   MOVB    #207,@TPDBR      ;PUSH A BELL AT THE TTY.
004060  032777  020000  175114   XBX:            BIT     #SW13,@SWR       ;DELETE ERROR PRINT OUT?
004066  001105                                   BNE     HALTS            ;BR IF NO PRINT OUT WANTED.
004070  021637  001234                           CMP     (SP),LSTERR      ;WAS THIS ERROR FOUND LAST TIME?
004074  001404                                   BEQ     1$               ;BR IF YES
004076  011637  001234                           MOV     (SP),LSTERR      ;RECORD BEING HERE
004102  105037  001311                           CLRB    ERRFLG           ;PREPARE HEADER
004106  104406                           1$:     SAV05                    ;SAVE ALL PROC REGISTERS
004110  011605                                   MOV     (SP),R5          ;GET THE PC OF ERROR
004112  162705  000002                           SUB     #2,R5            ;GET ADDRESS OF TRAP CALL
004116  011504                                   MOV     (R5),R4          ;GET HLT INSTRUCTION
004120  006304                                   ASL     R4               ;MULT BY TWO
004122  061504                                   ADD     (R5),R4          ;DOUBLE IT
004124  006304                                   ASL     R4               ;MULT AGAIN
004126  042704  177001                           BIC     #177001,R4       ;CLEAR JUNK
004132  062704  025364                           ADD     #.ERRTAB,R4      ;GET POINTER
004136  012437  004252                           MOV     (R4)+,ERRMSG     ;GET ERROR MESSAGE
004142  012437  004264                           MOV     (R4)+,DATAHD     ;GET DATA HEADRER
004146  011437  004276                           MOV     (R4),DATABP      ;GET DATA TABLE
004152  105737  001311                           TSTB    ERRFLG           ;TYPE HEADREER
004156  001403                                   BEQ     TYPMSG           ;BR IF YES
004160  005737  004276                           TST     DATABP           ;DOES DATA TABLE EXIST?
004164  001040                                   BNE     TYPDAT           ;BR IF YES.
004166  104402  005104                   TYPMSG: TYPE    ,MCRLF
004172  104402  005104                           TYPE    ,MCRLF
004176  005737  001220                           TST     LOCK
```

```
004202  001402                             BEQ     1$
004204  104402  005400                     TYPE    ,MASTEK
004210  104402  005366           1$:       TYPE    ,MTSTN
004214  104411  004374                     CNVRT   ,XTSTN          ;SHOW IT
004220  104402  005454                     TYPE    ,MERRPC         ;TYPE PC.
004224  104411  004366                     CNVRT   ,ERTAB0         ;SHOW IT
004230  104402  005104                     TYPE    ,MCRLF          ;GIVE A CR/LF
004234  112737  177777  001311             MOVB    #-1,ERRFLG      ;NO MORE HEADER UNLESS NO DATA TABLE.
004242  005737  004252                     TST     ERRMSG          ;IS THERE AN ERROR MESSAGE?
004246  001402                             BEQ     WRKO.FM         ;BR IF NO.
004250  104402                             TYPE                    ;TYPE
004252  000000                   ERRMSG: 0                         ;     ERROR MESSAGE
004254                           WRKO.FM:                          ;
004254  005737  004264                     TST     DATAHD          ;DATA HEADER?
004260  001402                             BEQ     TYPDAT          ;BR IF NO
004262  104402                             TYPE                    ;TYPE
004264  000000                   DATAHD: 0                         ;     DATA HEADER
004266  005737  004276           TYPDAT: TST     DATABP          ;DATA TABLE?
004272  001402                             BEQ     RESREG          ;BR IF NO.
004274  104410                             CONVRT                  ;SHOW
004276  000000                   DATABP: 0                         ;     DATA TABLE
004300  104407                   RESREG: RES05                     ;RESTORE PROC REGISTERS
004302  005777  174674           HALTS:  TST     @SWR            ;HALT ON ERROR?
004306  100005                             BPL     EXITER          ;BR IF NO HALT ON ERROR
004310  010046                             PUSHRO                  ;SAVE RO
004312  016600  000002                     MOV     2(SP),R0        ;SHOW ERROR PC IN DATA LIGHTS
004316  000000                             HALT                    ;HALT
004320  012600                             POPRO                   ;GET RO
004322  005237  001232           EXITER: INC     ERRCNT          ;UPDATE ERROR COUNT
004326  032777  000400  174646             BIT     #SW08,@SWR      ;GOTO TOP OF TEST?
004334  001007                             BNE     1$              ;BR IF YES
004336  032777  002000  174636             BIT     #SW10,@SWR      ;GOTO NEXT TEST?
004344  001407                             BEQ     2$              ;BR IF NO
004346  013737  001216  001214             MOV     NEXT,RETURN     ;SET FOR NEXT TEST
004354  012706  001200           1$:       MOV     #STACK,SP       ;RESET SP
004360  000177  174630                     JMP     @RETURN         ;GOTO SPECIFIED TEST
004364  000002                   2$:       RTI                     ;RETURN
004366  000001                   ERTAB0: 1
004370     006     002                     .BYTE   6,2
004372  001276                             SAVPC
004374  000001                   XTSTN:  1
004376     003     002                     .BYTE   3,2
004400  001226                             TSTNO
                                           ;ENTER HERE ON POWER FAILURE
                                           ;---------------------------



004402                           .PFAIL:
004402  012737  004414  000024             MOV     #RESTART,24              ;SET UP FOR POWER UP TRAP
004410  000000                             HALT                             ;HALT ON POWER DOWN NORMAL
004412  000777                             BR      .

                                           ;PROCESSOR WILL TRAP HERE WHEN POWER IS RESTORED

004414                           RESTAR:
004414  012737  004402  000024             MOV     #.PFAIL,24      ;SET UP FOR POWER FAILURE
```

```
004422  012706  001200                   MOV     #STACK,SP          ;RESET THE STACK POINTER
004426  005037  005562                   CLR     TEMP               ;READY FOR TIMMER
004432  005237  005562                   INC     TEMP               ;PLUS ONE TO THE TIMER!
004436  001375                           BNE     .-4                ;BR IF MORE TO GO
004440  104402  005107                   TYPE    ,MPFAIL            ;TYPE THE MESSAGE
004444  104411  004470                   CNVRT   ,PFTAB             ;TELL WHAT TEST TO RETURN TO.
004450  105037  001311                   CLRB    ERRFLG             ;START CLEAN
004454  005037  001234                   CLR     LSTERR             ;...........
004460  104412                           MSTCLR                     ;START CLEAN UP OF DEVICE
004462  104413                           RAMCLR                     ;CLEAR IT ALL!
004464  000177  174524                   JMP     @RETURN            ;START DOING THAT TEST AGAIN.
004470  000001                   PFTAB:  1
004472     003     002           .BYTE   3,2
004474  001226                           TSTNO
004476  010046                   .DELAY: MOV     R0,-(SP)
004500  013700  004514                   MOV     1$,R0
004504  005300                           DEC     R0
004506  001376                           BNE     .-2
004510  012600                           MOV     (SP)+,R0
004512  000002                           RTI
004514  000036                   1$:     30.

004516                           .RAMCLR:
004516  012777  004000  174636           MOV     #MRESET,@DVSCR     ;ISSUE A MASTER CLEAR
004524  010146                           MOV     R1,-(SP)           ;SAVE R1 ON THE STACK
004526  010446                           MOV     R4,-(SP)           ;SAVE R4 ON THE STACK
004530  013701  001372                   MOV     DVSRS,R1           ;GET SECONDARY SEL. REG.
004534  013704  001376                   MOV     DVSRA,R4           ;GET SECONDARY REGISTER ACCESS REG.
004540  005014                   1$:     CLR     (R4)               ;ZERO THE SECONDARY REGISTER.
004542  062711  170361                   ADD     #^C<BIT11+BIT10+BIT9+BIT8+BIT3+BIT2+BIT1+BIT0>+BIT0,(R1)
004546  001374                           BNE     1$
004550  012604                           MOV     (SP)+,R4           ;RESTORE R4
004552  012601                           MOV     (SP)+,R1           ;RESTORE R1
004554  000002                           RTI

004556                           .MSTCLR:
004556  012777  004000  174576           MOV     #MRESET,@DVSCR     ;ISSUE MASTER CLEAR.
004564  000002                           RTI

004566                           .ROMCLK:
004566  052777  000002  174566           BIS     #BIT1,@DVSCR
004574  000002                           RTI

004576                           .DATACLK:
004576  010046                           MOV     R0,-(SP)
004600  005000                           CLR     R0
004602  052777  000400  174560           BIS     #BIT8,@DVLCR
004610  017737  174554  004636   1$:     MOV     @DVLCR,3$
004616  106037  004637                   RORB    3$+1
004622  103003                           BCC     2$
004624  005200                           INC     R0
004626  001370                           BNE     1$
004630  104000                           HLT     0
004632  012600                   2$:     MOV     (SP)+,R0
004634  000002                           RTI
004636  000001                   3$:     .BLKW 1
```

```
    004640 032777  004000  174336  SERV.G: BIT     #4000,@TKCSR      ;RX BUSY?
    004646 001374                          BNE     SERV.G            ;BR IF YES
    004650 017737  174326  005072          MOV     @SWR,90$          ;SAVE (SWR).
    004656 013777  005072  174316  1$:     MOV     90$,@SWR          ;
    004664 104402  005052                  TYPE    ,89$              ;
    004670 104411  005064                  CNVRT   ,88$              ;
    004674 104402  005074                  TYPE    ,91$              ;
    004700 105777  174300                  TSTB    @TKCSR            ;WAIT FOR DONE.
    004704 100375                          BPL     .-4
    004706 017746  174274                  MOV     @TKDBR,-(SP)      ;
    004712 042716  000200                  BIC     #BIT7,(SP)        ;
    004716 122726  000015                  CMPB    #15,(SP)+         ;
    004722 001450                          BEQ     5$                ;
    004724 005077  174252                  CLR     @SWR              ;
    004730 105777  174254          2$:     TSTB    @TPCSR            ;
    004734 100375                          BPL     .-4
    004736 016677  177776  174246          MOV     -2(SP),@TPDBR     ;
    004744 000241                          CLC                       ;
    004746 006177  174230                  ROL     @SWR              ;
    004752 006177  174224                  ROL     @SWR              ;
    004756 006177  174220                  ROL     @SWR              ;
    004762 103735                          BCS     1$                ;ERROR
    004764 026627  177776  000060          CMP     -2(SP),#60        ;
    004772 002731                          BLT     1$                ;
    004774 026627  177776  000067          CMP     -2(SP),#67        ;
    005002 003325                          BGT     1$                ;
    005004 042766  177770  177776          BIC     #^C<7>,-2(SP)     ;
    005012 056677  177776  174162          BIS     -2(SP),@SWR       ;
    005020 105777  174160                  TSTB    @TKCSR            ;
    005024 100375                          BPL     .-4               ;
    005026 017746  174154                  MOV     @TKDBR,-(SP)
    005032 042716  000200                  BIC     #BIT7,(SP)
    005036 122726  000015                  CMPB    #15,(SP)+
    005042 001332                          BNE     2$                ;
    005044 104402  005104          5$:     TYPE    ,MCRLF            ;
    005050 000207                          RTS     PC

    005052 020377  051450  051127  89$:    .ASCIZ  <377>? (SWR)=/?
    005060 036451  000057
                                   .EVEN
    005064 000001                  88$:    1
    005066    006     000                  .BYTE   6,0
    005070 005072                          90$
    005072 000000                  90$:    .WORD   0
    005074 036457  000057          91$:    .ASCIZ  ?/=/?
                                   .EVEN
    005100 020040  000077          MQM:    .ASCIZ  /  ?/
(2) 005104 005015     000          MCRLF:  .ASCIZ   <15><12>
(2) 005107    377  053520  020122  MPFAIL: .ASCIZ  <377>/PWR FAILED. RESTART AT TEST /
(2) 005145    377  047105  020104  MEPASS: .ASCIZ  <377>/END PASS CZDVECO  /
(2) 005171    377  000122          MR:     .ASCIZ  <377>/R/
(2) 005174 050377  047522  051107  MERR2:  .ASCIZ  <377>/PROGRAM INDICATES NO DEVICES PRESENT./
(2) 005243    377  047111  052523  MERR3:  .ASCIZ  <377>/INSUFFICIENT DATA!/
(2) 005267    377  042524  052123  MTSTPC: .ASCIZ  <377>/TEST PC-/
(2) 005301    377  047514  045503  MLOCK:  .ASCIZ  <377>/LOCK ON SELECTED TEST/
```

```
(2)  005330  051503  035122  000040  MCSRX:   .ASCIZ   /CSR: /
(2)  005336  042526  035103  000040  MVECX:   .ASCIZ   /VEC: /
(2)  005344  040520  051523  051505  MPASSX:  .ASCIZ   /PASSES: /
(2)  005355     105  051122  051117  MERRX:   .ASCIZ   /ERRORS: /
(2)  005366  042524  052123  047040  MTSTN:   .ASCIZ   /TEST NO: /
(2)  005400  000052                  MASTEK:  .ASCIZ   /*/
(2)  005402  051777  052105  051440  MNEW:    .ASCIZ   <377>/SET SWITCH REG TO DV11'S DESIRED ACTIVE./
(2)  005454  041520  020072     000  MERRPC:  .ASCIZ   /PC: /
(2)  005461     377  040515  020120  XHEAD:   .ASCIZ   <377>/MAP OF DV11 STATUS/<377>
(2)                                  .EVEN
(2)  005506  000002                  XSTATQ: 2
     005510     006     003                   .BYTE    6,3
     005512  001246                           TEMP1
     005514     006     002                   .BYTE    6,2
     005516  001250                           TEMP2
                                     .EVEN

                                              ;BUFFERS FOR INPUT-OUTPUT

     005520  000000                  INBUF:   0
             005562                  .=.+40
     005562  000000                  TEMP:    0
             005624                  .=.+40
     005624  000000                  MDATA:   0
             005666                  .=.+40
```

```

                                        ;
                                        ;ROUTINE USED TO "CYCLE" THROUGH UP TO EIGHT DV11'S
                                        ;THIS ROUTINE SETS UP THE CONTROL ADDRESS FOR THE DIAGNOSTIC
                                        ;AND RUNS THE SPECIFIED DV11'S.   THIS ROUTINE *MUST*
                                        ;BE RUN FIRST BEFORE ENTERING THE DIAGNOSTIC FOR THE
                                        ;SETUP NECESSARY.
                                        ;

005666  105737  001300          CYCLE:  TSTB    DVACTV            ;ARE ANY DV11'S TO BE TESTED?
005672  001004                          BNE     1$                ;BR IF OK.
005674  104402  005174                  TYPE    ,MERR2            ;NO DV11'S SELECTED!!
005700  000000                          HALT                      ;STOP THE SHOW.
005702  000776                          BR      .-2               ;DISQUALIFY CONT. SW.
005704  133737  001304  001300  1$:     BITB    RUN,DVACTV        ;IS THIS ONE "ACTIVE"
005712  001020                          BNE     2$                ;BR IF GOOD ONE FOUND.
005714  000241                          CLC                       ;CLEAR PROC. CARRY BIT.
005716  106137  001304                  ROLB    RUN               ;UPDATE POINTER
005722  105537  001304                  ADCB    RUN               ;CATCH CARRY FROM RUN
005726  062737  000024  001306          ADD     #24,CREAM         ;UPDATE ADDRESS POINTER.
005734  022737  001740  001306          CMP     #DV.END,CREAM
005742  001360                          BNE     1$                ;KEEP GOING; NOT ALL TESTED FOR.
005744  012737  001500  001306          MOV     #DV.MAP,CREAM     ;RESET ADDRESS POINTER.
005752  000754                          BR      1$                ;KEEP LOOKING FOR ACTIVE DV11
005754  000241                  2$:     CLC                       ;CLEAR PROC. CARRY.
005756  106137  001304                  ROLB    RUN               ;UPDATE POINTER.
005762  105537  001304                  ADCB    RUN               ;CATCH CARRY.
005766  013700  001306                  MOV     CREAM,R0          ;GET ADDRESS POINTER.
005772  062737  000024  001306          ADD     #24,CREAM         ;UPDATE.
006000  022737  001740  001306          CMP     #DV.END,CREAM
                                                                  ;ALL DONE?
006006  001003                          BNE     3$                ;BR IF NO.
006010  012737  001500  001306          MOV     #DV.MAP,CREAM     ;RESTORE POINTER.
006016  012037  001362          3$:     MOV     (R0)+,DVSCR       ;LOAD SYSTEM CTRL. REG
006022  012037  001352                  MOV     (R0)+,DVRVEC      ;LOAD VECTOR
006026  012037  001422                  MOV     (R0)+,L00.03      ;GET LINE PARAMETERS. 00-03
006032  012037  001432                  MOV     (R0)+,SYNC2A      ;
006036  012037  001424                  MOV     (R0)+,L04.07      ;                     04-07
006042  012037  001434                  MOV     (R0)+,SYNC2B      ;
006046  012037  001426                  MOV     (R0)+,L08.11      ;                     08-11
006052  012037  001436                  MOV     (R0)+,SYNC2C      ;
006056  012037  001430                  MOV     (R0)+,L12.15      ;                     12-15
006062  012037  001440                  MOV     (R0)+,SYNC2D      ;
006066  012700  000002                  MOV     #2,R0             ;SAVE CORE THIS WAY!
006072  013737  001362  001364          MOV     DVSCR,DVSCRH      ;GET SYS CTRL. REG HIGH BYTE.
006100  005237  001364                  INC     DVSCRH            ;GOT IT.
006104  013737  001364  001366          MOV     DVSCRH,DVRIC      ;GET NXT REC. CHAR REG.
006112  005237  001366                  INC     DVRIC             ;GOT IT
006116  013737  001366  001370          MOV     DVRIC,DVLCR       ;GET LN. PAR.REG.
006124  060037  001370                  ADD     R0,DVLCR          ;GOT IT
006130  013737  001370  001372          MOV     DVLCR,DVSRS       ;GET SEC. REG. SEL. REG.
006136  060037  001372                  ADD     R0,DVSRS          ;GOT IT
006142  013737  001372  001374          MOV     DVSRS,DVSRSH      ;GET HIGH BYTE.
006150  005237  001374                  INC     DVSRSH            ;GOT IT
006154  013737  001374  001376          MOV     DVSRSH,DVSRA      ;SEC. REG. ACCESS.
006162  005237  001376                  INC     DVSRA             ;GOT IT
```

```
006166  013737  001376  001400          MOV     DVSRA,DVSFR         ;SPEC. FUN. REG.
006174  060037  001400                  ADD     R0,DVSFR            ;
006200  013737  001400  001402          MOV     DVSFR,DVNSR         ;NPR STAT. REG.
006206  060037  001402                  ADD     R0,DVNSR            ;
006212  013737  001402  001404          MOV     DVNSR,RESV16        ;RESERVED REG
006220  060037  001404                  ADD     R0,RESV16           ;

006224  013737  001352  001354          MOV     DVRVEC,DVRLVL       ;PTY LVL
006232  060037  001354                  ADD     R0,DVRLVL           ;
006236  013737  001354  001356          MOV     DVRLVL,DVTVEC       ;TX VEC
006244  060037  001356                  ADD     R0,DVTVEC           ;
006250  013737  001356  001360          MOV     DVTVEC,DVTLVL       ;TX LVL
006256  060037  001360                  ADD     R0,DVTLVL

006262  012700  001422                  MOV     #L00.03,R0          ;LOAD STAUS 00-03
006266  012701  001406                  MOV     #MASK.A,R1          ;PREPARE MASK.
006272  012702  001416                  MOV     #CLK.A,R2           ;PREPARE CLOCKS
006276  004737  006516                  JSR     PC,FIX.00           ;GO AND CALCULATE CONFIGURATION.

006302  012700  001424                  MOV     #L04.07,R0          ;LOAD STAUS 00-03
006306  012701  001410                  MOV     #MASK.B,R1          ;PREPARE MASK.
006312  012702  001417                  MOV     #CLK.B,R2           ;PREPARE CLOCKS
006316  004737  006516                  JSR     PC,FIX.00           ;GO AND CALCULATE CONFIGURATION.

006322  012700  001426                  MOV     #L08.11,R0          ;LOAD STAUS 00-03
006326  012701  001412                  MOV     #MASK.C,R1          ;PREPARE MASK.
006332  012702  001420                  MOV     #CLK.C,R2           ;PREPARE CLOCKS
006336  004737  006516                  JSR     PC,FIX.00           ;GO AND CALCULATE CONFIGURATION.

006342  012700  001430                  MOV     #L12.15,R0          ;LOAD STAUS 00-03
006346  012701  001414                  MOV     #MASK.D,R1          ;PREPARE MASK.
006352  012702  001421                  MOV     #CLK.D,R2           ;PREPARE CLOCKS
006356  004737  006516                  JSR     PC,FIX.00           ;GO AND CALCULATE CONFIGURATION.
006362  032777  000002  172612          BIT     #SW01,@SWR
006370  001445                          BEQ     7$
006372                          4$:
006372  005737  000042                  TST     @#42
006376  001042                          BNE     7$
006400  104402  005104                  TYPE    ,MCRLF
006404  104403                          INSTR
006406  005366                          MTSTN
006410  104405                          PARAM
006412  000001                          1
006414  001000                          1000
006416  001226                          TSTNO
006420     000                  .BYTE   0
006421     001                  .BYTE   1
006422  012700  007310                  MOV     #TST1,R0
006426  022710                  5$:     CMP     (PC)+,(R0)
006430  012737                          MOV     (PC)+,@(PC)+
006432  001015                          BNE     6$
006434  023760  001226  000002          CMP     TSTNO,2(R0)
006442  001011                          BNE     6$
006444  022760  001226  000004          CMP     #TSTNO,4(R0)
006452  001005                          BNE     6$
006454  010037  001214                  MOV     R0,RETURN
```

```
006460  104402  005104                    TYPE    .MCRLF
006464  000412                            BR      8$
006466  005720                  6$:       TST     (R0)+
006470  020027  020460                    CMP     R0,#TLAST+10
006474  001354                            BNE     5$
006476  104402  005100                    TYPE    .MQM
006502  000733                            BR      4$
006504  012737  007310  001214  7$:       MOV     #TST1,RETURN      ;PREPARE RETURN ADDRESS
006512  000177  172476          8$:       JMP     @RETURN           ;GO START TESTING.

006516  011003                  FIX.00:   MOV     (R0),R3           ;GET PARAMETERS.
006520  042703  176377                    BIC     #^C<1400>,R3      ;CLEAR JUNK.
006524  005703                            TST     R3                ;TEST FOR EIGHT BITS.
006526  001005                            BNE     1$                ;BR IF NOT 8 BITS.
006530  012711  000400                    MOV     #400,(R1)                 ;SET FOR 8 BITS PER CHAR
006534  112712  000010                    MOVB    #8.,(R2)          ;
006540  000424                            BR      4$
006542  022703  000400          1$:       CMP     #400,R3           ;CHECK FOR SEVEN BITS.
006546  001005                            BNE     2$                ;BR IF NOT 7 BITS.
006550  112711  000200                    MOVB    #200,(R1)         ;
006554  112712  000007                    MOVB    #7,(R2)           ;
006560  000414                            BR      4$
006562  022703  001000          2$:       CMP     #1000,R3          ;CHECK FOR SIX BITS.
006566  001005                            BNE     3$                ;BR IF NOT SIX BITS.
006570  112711  000300                    MOVB    #300,(R1)         ;
006574  112712  000006                    MOVB    #6,(R2)           ;
006600  000404                            BR      4$
006602  112711  000340          3$:       MOVB    #340,(R1)         ;IF NONE OF THE ABOVE; MUST BE 5 BITS.
006606  112712  000005                    MOVB    #5,(R2)           ;
006612  032710  040000          4$:       BIT     #PARBIT,(R0)      ;PARITY ENABLED?
006616  001401                            BEQ     5$                ;IF =0; THEN NO PARITY.
006620  105212                            INCB    (R2)              ;PLUS ONE TO THE CLOCK!
006622  000207                  5$:       RTS     PC                ;

                                          ;*ROUTINE USED TO ''AUTO SIZE'' THE DV11
                                          ;*CSR AND VECTOR.
                                          ;*NOTE: THE CSR MAY BE ANY WHERE IN THE FLOATING
                                          ;*       ADDRESS RANGE (175000:175400)
                                          ;*       AND THE VECTOR MAY BE ANY WHERE IN THE
                                          ;*       FLOATING VECTOR RANGE (300:770)
                                          ;*

006624                          AUTO.SIZE:
006624  000005                            RESET                     ;INSURE A BUS INIT.
006626  012702  001500          CSRMAP:   MOV     #DV.MAP,R2        ;LOAD MAP POINTER.
006632  005022                  1$:       CLR     (R2)+             ;ZERO ENTIRE MAP
006634  022702  001740                    CMP     #DV.END,R2        ;ALL DONE?
006640  001374                            BNE     1$                ;BR IF NO
006642  105037  001301                    CLRB    DVNUM             ;SET OCTAL NUMBER OF DV11'S TO 0
006646  012702  001500                    MOV     #DV.MAP,R2
006652  012701  175000                    MOV     #175000,R1        ;SET FOR FIRST ADDRESS TO BE TESTED
006656  012737  007076  000004            MOV     #6$,@#4           ;SET FOR NON-EXISTANT DEVICE TIME OUT
006664  005711                  2$:       TST     (R1)              ;IF DV11 DVSCR S/B 0
006666  001037                            BNE     3$                ;IF NO DEV ; TRAP TO 4. IF NO BIT 8 THEN NO DV11
006670  022761  177777  000012            CMP     #177777,12(R1)    ;IF DV11 THEN DVSFR S/B ALL 1'S ON INIT!
006676  001033                            BNE     3$                ;BR IF NOT DV11
```

```
006700  005761  000016                          TST     16(R1)          ;IF DV11 THEN RESV16 S/B ALL 0'S
006704  001030                                  BNE     3$              ;BR IF NOT DV11
                                        ;AT THIS POINT IT IS ASSUMED THAT R1 HOLDS A DV11 CSR ADDRESS.
006706  010122                                  MOV     R1,(R2)+        ;STORE CSR IN CORE TABLE.
006710  005722                                  TST     (R2)+           ;POP OVER VECTOR STORE AREA
006712  052722  000226                          BIS     #226,(R2)+      ;SET LINE CARD 1 STAT AND SYNC
006716  052722  000062                          BIS     #62,(R2)+       ;
006722  052722  000226                          BIS     #226,(R2)+      ;SET LINE CARD 2 STAT AND SYNC
006726  052722  000062                          BIS     #62,(R2)+       ;
006732  052722  000226                          BIS     #226,(R2)+      ;SET LINE CARD 3 STAT AND SYNC
006736  052722  000062                          BIS     #62,(R2)+       ;
006742  052722  000226                          BIS     #226,(R2)+      ;SET LINE CARD 4 STAT AND SYNC
006746  052722  000062                          BIS     #62,(R2)+       ;
006752  105237  001301                          INCB    DVNUM           ;UPDATE DEVICE COUNTER
006756  122737  000010  001301                  CMPB    #10,DVNUM       ;ARE MAX. NO. OF DEV FOUND?
006764  001405                                  BEQ     100$            ;YES DON'T LOOK FOR ANY MORE.
006766  062701  000010                  3$:     ADD     #10,R1          ;UPDATE CSR POINTER ADDRESS
006772  022701  175400                          CMP     #175400,R1
006776  001332                                  BNE     2$              ;BR IF MORE ADDRESS TO CHECK.
007000  012722  177777                  100$:   MOV     #177777,(R2)+   ;TERMINATER.
007004  105037  001300                          CLRB    DVACTV
007010  105737  001301                          TSTB    DVNUM           ;WERE ANY DV11'S FOUND AT ALL?
007014  001423                                  BEQ     5$              ;ERROR AUTO SIZER FOUND NO DV11'S IN THIS SYS.
007016  113701  001301                          MOVB    DVNUM,R1
007022  110137  001303                          MOVB    R1,SAVNUM       ;SAVE NUMBER OF DEVICES
007026  000241                          4$:     CLC
007030  106137  001300                          ROLB    DVACTV          ;GENERATE ACTIVE REGISTER OF DEVICES.
007034  105237  001300                          INCB    DVACTV          ;SET THE BIT
007040  005301                                  DEC     R1
007042  001371                                  BNE     4$              ;BR IF MORE TO GENERATE
007044  012737  000006  000004                  MOV     #6,@#4          ;RESTORE TRAP VECTOR
007052  113737  001300  001302                  MOVB    DVACTV,SAVACT   ;SAVE ACTIVE REGISTER
007060  000137  007104                          JMP     VECMAP          ;GO FIND THE VECTOR NOW.
007064  104402  005174                  5$:     TYPE    ,MERR2          ;NOTIFY OPR THAT NO DV11'S FOUND.
007070  005000                                  CLR     R0              ;MAKE DATA LIGHTS ZERO
007072  000000                                  HALT                    ;STOP THE SHOW
007074  000776                                  BR      .-2             ;DISABLE CONT. SW.
007076  012716  006766                  6$:     MOV     #3$,(SP)        ;ENTERED BY NON-EXISTANT TIME-OUT.
007102  000002                                  RTI                     ;RETURN TO MAINSTREAM

007104  012737  000340  000022          VECMAP: MOV     #340,@#22       ;SET IOT TRAP PRIO TO 7
007112  012737  007234  000020                  MOV     #4$,@#20        ;SET IOT TRAP VECTOR
007120  012702  001500                          MOV     #DV.MAP,R2      ;SET SOFTWARE POINTER
007124  012700  000300                          MOV     #300,R0         ;FLOATING VECTORS START HERE.
007130  012701  000302                          MOV     #302,R1         ;PC OF IOT INSTR.
007134  010120                          1$:     MOV     R1,(R0)+        ;START FILLING VECTOR AREA
007136  012721  000004                          MOV     #4,(R1)+        ;WITH .+2; IOT
007142  022021                                  CMP     (R0)+,(R1)+     ;ADD 2 TO R0 +R1
007144  020127  001000                          CMP     R1,#1000
007150  101771                                  BLOS    1$              ;BR IF MORE TO FILL
007152  113737  001300  001246                  MOVB    DVACTV,TEMP1    ;STORE TEMPORALLY
007160  006037  001246                  2$:     ROR     TEMP1           ;BRING OUT A BIT
007164  103034                                  BCC     5$              ;BR IF ALL DONE
007166  005037  177776                          CLR     PS              ;ZERO CPU PRIO
007172  012772  001300  000000                  MOV     #BIT9+BIT7+BIT6,@(R2)
007200  005000                                  CLR     R0              ;ATTEMPT TO FORCE AN INTERUPT
```

```
007202  005200                              INC     R0              ;STALL
007204  001376                              BNE     .-2             ;       FOR TIME TO INTERUPT
007206  052762  000300  000002              BIS     #300,2(R2)      ;NO INTERUPT ASSUME 300 AND FIX DV11 LATER
007214  042772  176777  000000      3$:     BIC     #^C<BIT9>,@(R2)
007222  005072  000000                      CLR     @(R2)
007226  062702  000024                      ADD     #24,R2          ;POP SOFTWARE POINTER
007232  000752                              BR      2$              ;KEEP GOING
007234  051662  000002              4$:     BIS     (SP),2(R2)      ;GET VECTOR ADDRESS
007240  042762  000007  000002              BIC     #7,2(R2)        ;CLEAR JUNK
007246  022626                              CMP     (SP)+,(SP)+     ;POP IOT JUNK OFF STACK
007250  012716  007214                      MOV     #3$,(SP)        ;SET FOR RETURN
007254  000002                              RTI
007256  000207                      5$:     RTS     PC              ;ALL DONE WITH ''AUTO SIZING''
```

```
                                ;CONTROL STATUS REGISTER BIT FUNCTIONS

        000020                  BUSY=20         ;LINE SCANNER RUNNING
        000040                  SCNENA=40       ;LINE SCANNER ENABLE
        000100                  INTENA=100      ;INTERRUPT ENABLE
        000200                  DONE=200        ;SCANNER DONE
        000400                  STEP=400        ;CAUSES LINE COUNTER TO BE INCREMENTED BY 1 COUNT
        001000                  MAINT=1000      ;FORCES 1S TO INPUT OF SCRATCH PAD MEMORY
        002000                  CLRMUX=2000     ;CLEAR MULTIPLEXER FUNCTION FLIPFLOPS
        004000                  CLRSCN=4000     ;CLEARS SCANNER SCRATCHPAD MEMORY
        010000                  SECRXF=10000    ;SECONDARY RECEIVE TRANSITION WAS DETECTED BY SCANNER
        020000                  CSF=20000       ;CLEAR TO SEND TRANSITION WAS DETECTED BY SCANNER
        040000                  COF=40000       ;CARRIER TRANSITION WAS DETECTED BY SCANNER
        100000                  RINGF=100000    ;RING SIGNAL WAS DETECTED BY SCANNER

                                ;LINE REGISTER BIT FUNCTIONS

        000001                  LINENA=BIT0     ;=1, RECOGNIZE TRANSITIONS ON THIS LINE
        000010                  SECTX=10        ;=1, SEND SECONDARY TRANSMIT TO MODEM
        000020                  SECRX=20        ;=1, SECONDARY RECEIVE TURNED ON BY MODEM
        000002                  TRMRDY=BIT1     ;=1, SEND TERMINAL READY TO MODEM
        000004                  RS=BIT2         ;=1, SEND REQUEST TO SEND TO MODEM
        000010                  NS=BIT3         ;=1,  NEW SYNC LEAD.
        000020                  DSR=BIT4        ;=1, DATA SET READY.
        000040                  CS=BIT5         ;=1, CLEAR TO SEND TURNED ON BY MODEM
        000100                  CO=BIT6         ;=1, CARRIER TURNED ON BY MODEM
        000200                  RING=BIT7       ;=1, RING TURNED ON BY MODEM

007260  000000                  TURFLG: 0
007262  000000                  LINE:   0
007264  000000                  POINTER:        0
007266  000000                  CHAR:   0
007270  000000                  COUNT:  0
007272  000000                  SELECT: 0
007274  000000                  EXERCISE:       0
007276  000000                  TOTAL:  0
007300  000001                  MC.CSR: .BLKW 1
007302  000001                  MC.LSR: .BLKW 1
007304  000300                  MC.VEC: 300             ;DEFAULT VECTOR!!
007306  000001                  MC.LVL: .BLKW 1


                ;*TABLE OF LOOP AROUND FUNCTIONS  (H325)
                ;*--------------------------------
;*
;*RING       CO       CTS      SECRX   SECTX      RTS     TRDY    LENAB  *** SIGNALS FOR ASYNC LC.
;*RING       CO       CTS       DSR     NS        RTS     TRDY    LENAB  *** SIGNALS FOR SYNC LC
;*BIT07     BIT06    BIT05    BIT04   BIT03    BIT02   BIT01    BIT00
;*                             ^        ^
;*           ^         ^        ---------         ^
;*  ^         ---------  --------------------------          ^
;*   ------------------------------------------------------
;*
;*
;*
```

```
;**********************************************************************
;*      THIS ''TEST 1'' IS NOT ACTUALLY A TEST.
;*      IT IS USED TO GET USERS INPUTS FOR WHICH LINE(S) ARE TO BE
;*      EXERCISED. THE PROGRAM WILL TYPE OUT:
;*      (A) H325
;*      (B) H861
;*      TYPE ''A'' ''OR ''B''
;*
;*      THE H325 TURN AROUND IS USED FOR THE SINGLE LINE
;*      TURN AROUND AT THE DISTRIBUTION PANEL OR
;*      AT THE END OF THE MODEM CABLE.
;*      THE H861 TURN AROUND IS USED FOR THE 16 LINE TURN AROUND.
;*      IF THE H325 WAS SELECTED (A) THE FOLLOWING WILL BE TYPED
;*      IF SW06=0:
;*      SELECT LINE(S):  XXXXXXXXXXXXXXXX
;*
;*      THE FIRST ''X'' REPRESENTS LINE 15 AND EACH ''X'' IS THE
;*      NEXT LOWER LINE TILL THE LAST ''X'' IS LINE 0. TYPE
;*      A ''1'' OR A ''0'' UNDER THE APPROIATE ''X''(LINE)
;*      TO EITHER SELECT(1) OR NOT TEST(0) EACH LINE.
;*      AFTER ALL 1'S AND 0'S ARE TYPED; TYPE A <CR>.
;*      THE PROGRAM WILL TYPE OUT IN OCTAL THE LINES YOU
;*      HAVE SELECTED; AND THE PROGRAM WILL BEGIN RUNNING
;*      THE HIGHEST SELECTED LINE THROUGH *ALL* TESTS THEN
;*      UPDATING TO THE NEXT LOWEST LINE TILL ALL SELECTED
;*      LINES ARE DONE. THEN THE PROGRAM WILL TYPE AN
;*      ''END'' CHAR.  PLEASE READ  THE SECTION ON PASS COMPLETE
;*                      IN DOCUMENT.
;*      IF THE H325 IS SELECTED AND SW06=1 THE FOLLOWING WILL BE TYPED:
;*      SINGLE LINE:
;*      THE USER MUST THEN TYPE IN A SINGLE LINE HE DESIRES (00-17) -OCTAL-
;*      END PASS IS THE SAME.
;*      REGUARDLESS OF WHICH CONNECTOR WAS SELECTED; THE
;*      THE LAST QUESTION IS:
;*      MODEM VECTOR:
;*      (THIS WILL BE ASKED ONLY AT THE INIATL START OF PROGRAM
;*      OR WHEN A DIFFERENT DV11 IN THE SYSTEM IS UNDER TEST)
;*      TYPE IN THE VECTOR OF THE MODEM CONTROL(300:774).
;*      THE CSR(MC.CSR) IS ASSUMED TO BE =DVSCR+20.
;*      NOTE:   IF CABLE TESTS ARE TO BE DONE ON OTHER
;*      DV11'S IN SYSTEM; SELECT THEM BY USING SW00 AS DESCRIBED
;*      IN THE DOCUMENTATION.
;*      UNLESS LOCATION 42 IS NON-ZERO IN WHICH CASE THE PROGRAM
;*      ASSUMES ITS UNDER ACT-11 MONITOR.  THE PROGRAM WILL
;*      CYCLE THROUGH ALL DV11S AND MODEM CONTROL *HOWEVER*
;*      THE RESTRICTIONS ARE:
;*      ***ALL*** MODEM VECTORS MUST BE AT 300
;*      ***ALL*** TURN AROUNDS MUST BE H861.
;*      ''LONG END PASS'' WILL BE GIVEN AT END OF LARGE END TO
;*              INDICATE DEVICES TESTED. PASSES TYPED IN THIS
;*              MESSAGE DO NOT INDICATE PASSES BUT RATHER THE
;*              NUMBER OF FULL PASSES THROUGH MULTIPLE DEVICES.
;*                      !LARGE END AND TYPE OUT MAY BE INHIBITED BY SW12!
;**********************************************************************
```

```
                                         ;  TEST 1
                                         ;---------------
007310  012737  000001  001226   TST1:   MOV     #1,TSTNO
007316  012737  010770  001216           MOV     #TST2,NEXT
007324  005037  177776                   CLR     PS                ;CLEAR CPU STATUS
007330  013737  001362  007300           MOV     DVSCR,MC.CSR      ;GET MODEM CSR
007336  062737  000020  007300           ADD     #20,MC.CSR        ;IT HAS TO BE 20(8) MORE THAN DVSCR.
007344  013737  007300  007302           MOV     MC.CSR,MC.LSR     ;GET MODEM LSR
007352  062737  000002  007302           ADD     #2,MC.LSR         ;MUST BE 2 MORE THAN CSR
007360  012737  010276  000060           MOV     #KBISR,@#60       ;SET KEYBOARD INTERUPT VEC
007366  012737  000340  000062           MOV     #340,@#62         ;SET LEV TO 7
007374  012777  000100  171602           MOV     #100,@TKCSR       ;SET INTERUPT ENABLE
007402  012737  000340  177776           MOV     #340,PS           ;LOCK OUT TTY
007410  005737  000042                   TST     @#42
007414  001020                           BNE     44$
007416  104402  022672           1$:     TYPE    ,MTURN
007422  004737  022760                   JSR     PC,TKRDY
007426  122737  000101  001272           CMPB    #101,SAVR5
007434  001004                           BNE     70$
007436  012737  000377  007260           MOV     #377,TURFLG
007444  000412                           BR      71$
007446  122737  000102  001272   70$:    CMPB    #102,SAVR5
007454  001360                           BNE     1$
007456  005037  007260           44$:    CLR     TURFLG
007462  012737  000001  007272           MOV     #1,SELECT
007470  000523                           BR      68$
007472  032777  000100  171502   71$:    BIT     #SW06,@SWR
007500  001421                           BEQ     72$
        007502                   MAR18=.
007502  104403  022234                   INSTR   ,MSING
007506  104405                           PARAM
007510  000000                           00
007512  000017                           17
007514  007262                           LINE
007516     000     001                   .BYTE   0,1
007520  012737  000001  007272           MOV     #1,SELECT
007526  005337  007262           74$:    DEC     LINE
007532  100502                           BMI     68$
007534  000241                           CLC
007536  006137  007272                   ROL     SELECT
007542  000771                           BR      74$
007544  104402  022121           72$:    TYPE    ,MSEL             ;ASK FOR LINES
007550  013737  007272  001252           MOV     SELECT,TEMP3      ;GET PREVIOUS LINE SELECT
007556  005037  007272                   CLR     SELECT            ;MAKE IT 0
007562  105777  171416           2$:     TSTB    @TKCSR            ;READY?
007566  100375                           BPL     2$                ;BR IF NO
007570  017700  171412                   MOV     @TKDBR,R0         ;READ CHAR
007574  010077  171412                   MOV     R0,@TPDBR         ;ECHO CHAR
007600  042700  177600                   BIC     #^C<177>,R0       ;STRIP ALL BUT DATA
007604  022700  000123                   CMP     #123,R0           ;WAS IT ''S(AME)''
007610  001004                           BNE     .+12              ;BR IF NO
007612  013737  001252  007272           MOV     TEMP3,SELECT      ;RESTORE PREVIOUS LINES SELECTED
007620  000415                           BR      4$                ;GO ON
007622  022700  000015                   CMP     #15,R0            ;WAS IT ''<CR>''
007626  001412                           BEQ     4$                ;BR IF YES
007630  022700  000060                   CMP     #60,R0            ;WAS IT ''0''
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007634  001403                                   BEQ     3$                  ;BR IF YES
007636  022700  000061                           CMP     #61,R0              ;WAS IT ''1''
007642  001265                                   BNE     1$                  ;BR IF NO. RETYPE MSG
007644  006000                          3$:      ROR     R0                  ;SHIFT THE BITS
007646  006137  007272                           ROL     SELECT              ;BRING CARRY INTO SELECT
007652  000743                                   BR      2$                  ;CONT.
007654  005737  007272                  4$:      TST     SELECT              ;ARE ANY LINES SELECTED?
007660  001656                                   BEQ     1$                  ;BR IF NO. AND TYPE MSG
007662  005037  001266                           CLR     SAVR3               ;SET TYPE OUT
007666  013705  007272                           MOV     SELECT,R5           ;SAVE
007672  104402  022202                           TYPE    ,MLINE              ;ALERT USER TO WHAT
007676  005037  177776                  65$:     CLR     PS                  ;HE SELECTED
007702  006005                          5$:      ROR     R5                  ;
007704  103002                                   BCC     6$                  ;
007706  104411  023044                           CNVRT   ,XXLIN              ;
007712  005237  001266                  6$:      INC     SAVR3               ;
007716  022737  000020  001266                   CMP     #16.,SAVR3          ;
007724  001366                                   BNE     5$                  ;
007726  104402  022231                           TYPE    ,M.CRLF             ;
007732  022700  000123                           CMP     #123,R0             ;
007736  001427                                   BEQ     69$                 ;
007740  005737  000042                  68$:     TST     @#42
007744  001016                                   BNE     98$
007746  022737                                   CMP     (PC)+,@(PC)+
007750  000000                          80$:     .WORD   0
007752  001362                                   DVSCR
007754  001412                                   BEQ     98$
007756  104403  022737                           INSTR   ,MVECZ              ;
007762  104405                                   PARAM
007764  000300                                   300
007766  000774                                   774
007770  007304                                   MC.VEC
007772     003     001                           .BYTE   3,1
007774  013737  001362  007750                   MOV     DVSCR,80$
010002  013737  007304  007306          98$:     MOV     MC.VEC,MC.LVL       ;GET PRIORITY LEVEL
010010  062737  000002  007306                   ADD     #2,MC.LVL           ;UP IT.
010016  012737  010330  007264          69$:     MOV     #TABLE,POINTER      ;
010024  117737  177234  007270                   MOVB    @POINTER,COUNT      ;
010032  005237  007264                           INC     POINTER             ;
010036  117737  177222  007266                   MOVB    @POINTER,CHAR       ;
010044  005237  007264                           INC     POINTER             ;
010050  013737  007272  007274                   MOV     SELECT,EXERCISE     ;
010056  012737  000020  007262                   MOV     #20,LINE            ;
010064  005337  007262                  TESTER:  DEC     LINE                ;
010070  006337  007274                           ASL     EXERCISE            ;
010074  103451                                   BCS     2$                  ;
010076  001372                                   BNE     TESTER              ;
010100  112737  000377  001313                   MOVB    #377,QV.FLG         ;
010106  104402  007266                           TYPE    ,CHAR               ;
010112  005337  007270                           DEC     COUNT               ;
010116  001031                                   BNE     3$                  ;
010120  117737  177140  007270                   MOVB    @POINTER,COUNT      ;
010126  001016                                   BNE     4$                  ;
010130  005737  000042                           TST     42
010134  001405                                   BEQ     .+14
010136  012737  002436  001214                   MOV     #.EOP,RETURN
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010144  000177  171044                    JMP     @RETURN
010150  012737  010330  007264            MOV     #TABLE,POINTER     ;
010156  117737  177102  007270            MOVB    @POINTER,COUNT     ;
010164  005237  007264          4$:       INC     POINTER            ;
010170  117737  177070  007266            MOVB    @POINTER,CHAR
010176  005237  007264                    INC     POINTER            ;
010202  013737  007272  007274  3$:       MOV     SELECT,EXERCISE    ;
010210  012737  000020  007262            MOV     #20,LINE           ;
010216  000722                            BR      TESTER             ;
010220  012737  010770  001214  2$:       MOV     #TST2,RETURN       ;
010226  013737  001214  001216            MOV     RETURN,NEXT        ;
010234  005046                            CLR     -(SP)              ;SET FOR FAKE INTR
010236  012746  010272                    MOV     #5$,-(SP)          ;SET FAKE PC OF INTR
010242  032777  004000  170734            BIT     #BIT11,@TKCSR      ;TTY ACTIVE?
010250  001374                            BNE     .-6                ;YES WAIT TILL DONE.
010252  017746  170730                    MOV     @TKDBR,-(SP)
010256  042716  000200                    BIC     #BIT7,(SP)         ;CLEAR PARITY
010262  122726  000001                    CMPB    #1,(SP)+           ;WAS ^A (CHANGE LINES) HIT?
010266  001403                            BEQ     KBISR              ;BR IF YES
010270  022626                            CMP     (SP)+,(SP)+        ;BR TO KBISR NOT TAKEN
                                                                     ;POP FAKE INTR OFF STACK
010272  000177  170716          5$:       JMP     @RETURN            ;

010276  010046                  KBISR:    MOV     R0,-(SP)           ;
010300  017700  170702                    MOV     @TKDBR,R0          ;SAVE CHAR IN R0
010304  042700  177600                    BIC     #^C<177>,R0        ;CLEAR ALL BUT DATA
010310  022700  000001                    CMP     #1,R0              ;WAS IT <^A> (CNTRL A)?
010314  001003                            BNE     1$                 ;BR IF NO
010316  012766  007502  000002            MOV     #MAR18,2(SP)       ;SET RETURN
010324  012600                  1$:       MOV     (SP)+,R0           ;RESTORE R0
010326  000002                            RTI                        ;CONT.

010330     001     015     002  TABLE:    .BYTE 1,15,2,12
010334     010     040     012            .BYTE 8.,40,10.,105,4,40,2,116,6,40,2,116,4,40,8.,104
010354     001     015     001            .BYTE 1,15,1,12
010360     010     040     012            .BYTE 8.,40,10.,105,4,40,2,116,6,40,2,116,4,40,8.,104
010400     001     015     001            .BYTE 1,15,1,12
010404     010     040     002            .BYTE 8.,40,2,105,12.,40,2,116,6,40,2,116,4,40,2,104,6,40,2,104
010430     001     015     001            .BYTE 1,15,1,12
010434     010     040     002            .BYTE 8.,40,2,105,12.,40,2,116,6,40,2,116,4,40,2,104,6,40,2,104
010460     001     015     001            .BYTE 1,15,1,12
010464     010     040     002            .BYTE 8.,40,2,105,12.,40,4,116,4,40,2,116,4,40,2,104,6,40,2,104
010510     001     015     001            .BYTE 1,15,1,12
010514     010     040     002            .BYTE 8.,40,2,105,12.,40,4,116,4,40,2,116,4,40,2,104,6,40,2,104
010540     001     015     001            .BYTE 1,15,1,12
010544     010     040     010            .BYTE 8.,40,8.,105,6,40,2,116,2,40,2,116,2,40,2,116,4,40,2,104,6,40,2,104
010574     001     015     001            .BYTE 1,15,1,12
010600     010     040     010            .BYTE 8.,40,8.,105,6,40,2,116,2,40,2,116,2,40,2,116,4,40,2,104,6,40,2,104
010630     001     015     001            .BYTE 1,15,1,12
010634     010     040     002            .BYTE 8.,40,2,105,12.,40,2,116,4,40,4,116,4,40,2,104,6,40,2,104
010660     001     015     001            .BYTE 1,15,1,12
010664     010     040     002            .BYTE 8.,40,2,105,12.,40,2,116,4,40,4,116,4,40,2,104,6,40,2,104
010710     001     015     001            .BYTE 1,15,1,12
010714     010     040     012            .BYTE 8.,40,10.,105,4,40,2,116,6,40,2,116,4,40,8.,104
010734     001     015     001            .BYTE 1,15,1,12
010740     010     040     012            .BYTE 8.,40,10.,105,4,40,2,116,6,40,2,116,4,40,8.,104
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        010760      001      015      001            .BYTE 1,15,1,12
        010764      000      000      000            .BYTE 0,0,0
                010770                               .EVEN
```

```
                                                  ;************************* TEST 2 *******************************
                                                  ;*INITIALIZATION CHECK
                                                  ;*VERIFY THAT CONTROL STATUS REGISTER AND LINE STATUS
                                                  ;*REGISTER WERE CLEARED BY INITIALIZE
                                                  ;:*****************************************************************


                                          ;  TEST 2
                                          ;--------------
010770  012737  000002  001226    TST2:   MOV     #2,TSTNO
010776  012737  011126  001216            MOV     #TST3,NEXT
011004  105777  170200                    TSTB    @TPCSR                       ;WAIT FOR TTY READY
011010  100375                            BPL     .-4                          ;BR IF NOT READY
011012  000005                            RESET                                ;INIT
011014  005005                            CLR     R5
011016  052777  000100  170160            BIS     #100,@TKCSR                  ;SET TTY INTERUPT ENABLE
011024  012737  011114  000004            MOV     #1$,@#4                      ;SET FOR NON-EX DEVICE.
011032  012702  000010                    MOV     #8.,R2                       ;SET COUNTER
011036  027777  170142  170140    65$:    CMP     @TKCSR,@TKCSR                ;WASTE TIME
011044  027777  170134  170132            CMP     @TKCSR,@TKCSR                ;WASTE TIME
011052  005302                            DEC     R2                           ;DELAY DONE?
011054  001370                            BNE     65$                          ;BR IF NO
011056  005200                            INC     R0                           ;FLASH LIGHTS
011060  013703  007300                    MOV     MC.CSR,R3                    ;SET MC.CSR POINTER
011064  011304                            MOV     (R3),R4                      ;READ REGISTER
011066  001401                            BEQ     .+4
011070  104002                            HLT     2                            ;CONTROL STATUS NOT CLEARED, ERROR
011072  013703  007302                    MOV     MC.LSR,R3                    ;SET POINTER
011076  011304                            MOV     (R3),R4                      ;READ MC.LSR
011100  001401                            BEQ     .+4
011102  104002                            HLT     2                            ;LINE STATUS NOT CLEARED, ERROR
011104  012737  000006  000004            MOV     #6,@#4                       ;RESET TRAP CATCHER
011112  104400                            SCOPE                                ;CHECK FOR LOOP
011114  104005                    1$:     HLT     5                            ;SHOULD NOT TRAP.
011116  012706  001200                    MOV     #STACK,SP                    ;
011122  000177  170066                    JMP     @RETURN



                                                  ;************************* TEST 3 *******************************
                                                  ;*VERIFY THAT ''INTERUPT ENABLE'' CAN BE
                                                  ;*SET AND CLEARED.
                                                  ;:*****************************************************************


                                          ;  TEST 3
                                          ;--------------
011126  012737  000003  001226    TST3:   MOV     #3,TSTNO
011134  012737  011220  001216            MOV     #TST4,NEXT
011142  013703  007300                    MOV     MC.CSR,R3                    ;SET POINTER TO MC.CSR
011146  012713  000100                    MOV     #INTENA,(R3)                 ;LOAD FUNCTION
011152  011304                            MOV     (R3),R4                      ;READ RESULTS
011154  042704  177677                    BIC     #^C<INTENA>,R4               ;MASK OFF ALL OTHER BITS.
011160  012705  000100                    MOV     #INTENA,R5                             ;MAKE R5=GOOD
011164  020504                            CMP     R5,R4                        ;RESULTS OK?
011166  001401                            BEQ     .+4                          ;BR IF YES
011170  104002                            HLT     2                            ;ERROR. R5=GOOD,R4=BAD,R3=REGISTER
011172  042705  000100                    BIC     #INTENA,R5
011176  042713  000100                    BIC     #INTENA,(R3)                 ;CLEAR BIT
```

```
011202  011304                                  MOV     (R3),R4                 ;READ REGISTER
011204  042704  177677                          BIC     #^C<INTENA>,R4          ;MASK OFF ALL OTHER BITS.
011210  020504                                  CMP     R5,R4                   ;REGISTER OK?
011212  001401                                  BEQ     .+4                     ;BR IF YES
011214  104002                                  HLT     2                       ;BIT FAILED TO CLEAR
011216  104400                                  SCOPE                           ;SCOPE TEST.


                                                ;************************ TEST 4 *********************************
                                                ;*VERIFY THAT 'DONE'' CAN BE
                                                ;*SET AND CLEARED.
                                                ;;***************************************************************

                                        ;  TEST 4
                                        ;--------------
011220  012737  000004  001226          TST4:   MOV     #4,TSTNO
011226  012737  011312  001216                  MOV     #TST5,NEXT
011234  013703  007300                          MOV     MC.CSR,R3               ;SET POINTER TO MC.CSR
011240  012713  000200                          MOV     #DONE,(R3)              ;LOAD FUNCTION
011244  011304                                  MOV     (R3),R4                 ;READ RESULTS
011246  042704  177577                          BIC     #^C<DONE>,R4            ;MASK OFF ALL OTHER BITS.
011252  012705  000200                          MOV     #DONE,R5                        ;MAKE R5=GOOD
011256  020504                                  CMP     R5,R4                   ;RESULTS OK?
011260  001401                                  BEQ     .+4                     ;BR IF YES
011262  104002                                  HLT     2                       ;ERROR. R5=GOOD,R4=BAD,R3=REGISTER
011264  042705  000200                          BIC     #DONE,R5
011270  042713  000200                          BIC     #DONE,(R3)              ;CLEAR BIT
011274  011304                                  MOV     (R3),R4                 ;READ REGISTER
011276  042704  177577                          BIC     #^C<DONE>,R4            ;MASK OFF ALL OTHER BITS.
011302  020504                                  CMP     R5,R4                   ;REGISTER OK?
011304  001401                                  BEQ     .+4                     ;BR IF YES
011306  104002                                  HLT     2                       ;BIT FAILED TO CLEAR
011310  104400                                  SCOPE                           ;SCOPE TEST.


                                                ;************************ TEST 5 *********************************
                                                ;*VERIFY THAT 'MAINTENANCE MODE'' CAN BE
                                                ;*SET AND CLEARED.
                                                ;;***************************************************************

                                        ;  TEST 5
                                        ;--------------
011312  012737  000005  001226          TST5:   MOV     #5,TSTNO
011320  012737  011404  001216                  MOV     #TST6,NEXT
011326  013703  007300                          MOV     MC.CSR,R3               ;SET POINTER TO MC.CSR
011332  012713  001000                          MOV     #MAINT,(R3)             ;LOAD FUNCTION
011336  011304                                  MOV     (R3),R4                 ;READ RESULTS
011340  042704  176777                          BIC     #^C<MAINT>,R4           ;MASK OFF ALL OTHER BITS.
011344  012705  001000                          MOV     #MAINT,R5                       ;MAKE R5=GOOD
011350  020504                                  CMP     R5,R4                   ;RESULTS OK?
011352  001401                                  BEQ     .+4                     ;BR IF YES
011354  104002                                  HLT     2                       ;ERROR. R5=GOOD,R4=BAD,R3=REGISTER
011356  042705  001000                          BIC     #MAINT,R5
011362  042713  001000                          BIC     #MAINT,(R3)             ;CLEAR BIT
011366  011304                                  MOV     (R3),R4                 ;READ REGISTER
011370  042704  176777                          BIC     #^C<MAINT>,R4           ;MASK OFF ALL OTHER BITS.
```

```
011374  020504                          CMP     R5,R4                           ;REGISTER OK?
011376  001401                          BEQ     .+4                             ;BR IF YES
011400  104002                          HLT     2                               ;BIT FAILED TO CLEAR
011402  104400                          SCOPE                                   ;SCOPE TEST.


                                ;************************ TEST 6 ******************************
                                ;*VERIFY THAT ''SCAN ENABLE'' CAN BE
                                ;*SET AND CLEARED.
                                ;:*************************************************************

                        ;  TEST 6
                        ;---------------
011404  012737  000006  001226  TST6:   MOV     #6,TSTNO
011412  012737  011476  001216          MOV     #TST7,NEXT
011420  013703  007300                  MOV     MC.CSR,R3                       ;SET POINTER TO MC.CSR
011424  012713  000040                  MOV     #SCNENA,(R3)                    ;LOAD FUNCTION
011430  011304                          MOV     (R3),R4                         ;READ RESULTS
011432  042704  177737                  BIC     #^C<SCNENA>,R4                  ;MASK OFF ALL OTHER BITS.
011436  012705  000040                  MOV     #SCNENA,R5                              ;MAKE R5=GOOD
011442  020504                          CMP     R5,R4                           ;RESULTS OK?
011444  001401                          BEQ     .+4                             ;BR IF YES
011446  104002                          HLT     2                               ;ERROR. R5=GOOD,R4=BAD,R3=REGISTER
011450  042705  000040                  BIC     #SCNENA,R5
011454  042713  000040                  BIC     #SCNENA,(R3)                    ;CLEAR BIT
011460  011304                          MOV     (R3),R4                         ;READ REGISTER
011462  042704  177737                  BIC     #^C<SCNENA>,R4                  ;MASK OFF ALL OTHER BITS.
011466  020504                          CMP     R5,R4                           ;REGISTER OK?
011470  001401                          BEQ     .+4                             ;BR IF YES
011472  104002                          HLT     2                               ;BIT FAILED TO CLEAR
011474  104400                          SCOPE                                   ;SCOPE TEST.
```

```
                                                ;************************ TEST 7 ********************************
                                                ;*VERIFY THAT ''BUSY'' IS SET WHEN ''SCAN ENABLE'' IS SET
                                                ;*VERIFY THAT ''BUSY'' IS CLEARED WHEN ''SCAN ENABLE'' IS CLEARED
                                                ;:*****************************************************************


                                        ;  TEST 7
                                        ;---------------
011476  012737  000007  001226          TST7:   MOV     #7,TSTNO
011504  012737  011600  001216                  MOV     #TST10,NEXT
011512  013703  007300                          MOV     MC.CSR,R3               ;SET REGISTER POINTER
011516  012713  000040                          MOV     #SCNENA,(R3)            ;SET SCAN ENABLE
011522  011304                                  MOV     (R3),R4                 ;READ REGISTER
011524  010405                                  MOV     R4,R5                   ;GET IMAGE
011526  052705  000020                          BIS     #BUSY,R5                ;SET BUSY BIT IN GOOD.
011532  020504                                  CMP     R5,R4                   ;REGISTER OK?
011534  001401                                  BEQ     .+4
011536  104002                                  HLT     2                       ;BUSY NOT SET, ERROR
011540  042713  000040                          BIC     #SCNENA,(R3)            ;CLEAR SCAN ENABLE
011544  023737  000000  000000                  CMP     0,0                     ;GIVE BUSY A CHANCE TO CLEAR
011552  023737  000000  000000                  CMP     0,0                     ;WHEN ON A HOT ROD MACHINE (11/70)!
011560  011304                                  MOV     (R3),R4                 ;READ MC.CSR
011562  010405                                  MOV     R4,R5                   ;GET IMAGE
011564  042705  000020                          BIC     #BUSY,R5                ;CLEAR BUSY IN GOOD.
011570  020504                                  CMP     R5,R4                   ;BUSY CLEARED?
011572  001401                                  BEQ     .+4
011574  104002                                  HLT     2                       ;BUSY NOT CLEARED, ERROR
011576  104400                                  SCOPE                           ;CHECK FOR LOOP, ITERATIONS

                                                ;************************ TEST 10 ********************************
                                                ;*VERIFY THAT SETTING ''DONE'' DOES NOT CAUSE AN
                                                ;*INTERRUPT IF ''INTERRUPT ENABLE'' IS CLEARED.
                                                ;:*****************************************************************


                                        ;  TEST 10
                                        ;---------------
011600  012737  000010  001226          TST10:  MOV     #10,TSTNO
011606  012737  011666  001216                  MOV     #TST11,NEXT
011614  012737  000340  177776                  MOV     #340,PS                 ;LOCK OUT INTERRUPTS
011622  005077  175452                          CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
011626  012777  011660  175450                  MOV     #1$,@MC.VEC             ;SET UP INTERRUPT SERVICE ADDRESS
011634  012777  000340  175444                  MOV     #340,@MC.LVL            ;SET UP INTERRUPT PRIORITY
011642  052777  000200  175430                  BIS     #DONE,@MC.CSR           ;SET DONE
011650  005037  177776                          CLR     PS                      ;ALLOW INTERRUPTS
011654  000240                                  NOP                             ;DELAY FOR INTERRUPT
011656  000402                                  BR      2$                      ;NO INTERRUPT, CONTINUE
011660  022626                          1$:     POP2SP                          ;RESTORE STACK, INTERRUPT
011662  104003                                  HLT     3                       ;OCCURED, ERROR
011664  104400                          2$:     SCOPE                           ;CHECK FOR LOOP, ITERATIONS
```

```

                                                ;************************ TEST 11 ******************************
                                                ;*VERIFY THAT NO INTERRUPT OCCURS WITH ''INTERRUPT ENABLE''
                                                ;*SET AND ''DONE'' CLEARED.
                                                ;;************************************************************

                                        ;  TEST 11
                                        ;--------------
011666  012737  000011  001226          TST11:  MOV     #11,TSTNO
011674  012737  011754  001216                  MOV     #TST12,NEXT
011702  012737  000340  177776                  MOV     #340,PS                         ;LOCK OUT INTERRUPTS
011710  005077  175364                          CLR     @MC.CSR                         ;CLEAR CONTROL REGISTER
011714  012777  011746  175362                  MOV     #1$,@MC.VEC                     ;SET UP INTERRUPT SERVICE ADDRESS
011722  012777  000340  175356                  MOV     #340,@MC.LVL                    ;SET UP INTERRUPT SERVICE LEVEL
011730  052777  000100  175342                  BIS     #INTENA,@MC.CSR                 ;SET INTERRUPT ENABLE
011736  005037  177776                          CLR     PS                              ;ALLOW INTERRUPTS
011742  000240                                  NOP                                     ;DELAY FOR INTERRUPTS
011744  000402                                  BR      2$                              ;NO INTERRUPT, CONTINUE
011746  022626                          1$:     POP2SP                                  ;RESTORE STACK
011750  104003                                  HLT     3                               ;INTERRUPT OCCURED, ERROR
011752  104400                          2$:     SCOPE                                   ;CHECK FOR ITERATIONS, LOOP

                                                ;************************ TEST 12 ******************************
                                                ;*VERIFY THAT SETTING ''DONE'' CAUSES AN INTERRUPT
                                                ;*WITH ''INTERRUPT ENABLE'' SET
                                                ;;************************************************************

                                        ;  TEST 12
                                        ;--------------
011754  012737  000012  001226          TST12:  MOV     #12,TSTNO
011762  012737  012050  001216                  MOV     #TST13,NEXT
011770  012737  000340  177776                  MOV     #340,PS                         ;LOCK OUT INTERRUPTS
011776  005077  175276                          CLR     @MC.CSR                         ;CLEAR CONTROL REGISTER
012002  012777  012044  175274                  MOV     #1$,@MC.VEC                     ;SET UP INTERRUPT SERVICE ADDRESS
012010  012777  000100  175262                  MOV     #INTENA,@MC.CSR                 ;SET ''INTERRUPT ENABLE''
012016  012777  000340  175262                  MOV     #340,@MC.LVL                    ;SET ''INTERRUPT LEVEL''
012024  005037  177776                          CLR     PS                              ;ALLOW INTERRUPTS
012030  052777  000200  175242                  BIS     #DONE,@MC.CSR                   ;SET ''DONE''
012036  000240                                  NOP                                     ;DELAY FOR INTERRUPT
012040  104004                                  HLT     4                               ;INTERRUPT OCCURED, ERROR
012042  000401                                  BR      2$                              ;CONTINUE
012044  022626                          1$:     POP2SP                                  ;INTERRUPT OCCURED, RESTOR STACK
012046  104400                          2$:     SCOPE                                   ;CHECK FOR ITERATION, LOOP

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                                                ;************************* TEST 13 *******************************
                                                ;*VERIFY THAT NO INTERRUPT OCCURS WITH
                                                ;*''INTERRUPT ENABLE'' SET AND ''DONE'' SET AT PRIORITY 7.
                                                ;:****************************************************************

                                        ;  TEST 13
                                        ;--------------
012050  012737  000013  001226          TST13:  MOV     #13,TSTNO
012056  012737  012140  001216                  MOV     #TST14,NEXT
012064  005077  175210                          CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
012070  012737  000340  177776                  MOV     #340,PS                 ;TO LEVEL 7.
012076  012777  012132  175200                  MOV     #1$,@MC.VEC             ;SET UP INTERRUPT SERVICE ADDRESS
012104  012777  000340  175174                  MOV     #340,@MC.LVL            ;SET UP INTERRUPT SERVICE LEVEL
012112  012777  000100  175160                  MOV     #INTENA,@MC.CSR         ;SET INTERRUPT ENABLE
012120  052777  000200  175152                  BIS     #DONE,@MC.CSR           ;GENERATE INTERRUPT
012126  000240                                  NOP                             ;DELAY FOR INTERRUPT
012130  000402                                  BR      2$                      ;NO INTERRUPT, CONTINUE
012132  022626                          1$:     POP2SP                          ;RESTORE STACK
012134  104003                                  HLT     3                       ;INTERRUPT OCCURED, ERROR
012136  104400                          2$:     SCOPE                           ;CHECK FOR ITERATION, LOOP

                                                ;************************* TEST 14 *******************************
                                                ;*VERIFY THAT NO INTERRUPT OCCURS WITH
                                                ;*''INTERRUPT ENABLE'' SET AND ''DONE'' SET AT PRIORITY 6.
                                                ;:****************************************************************

                                        ;  TEST 14
                                        ;--------------
012140  012737  000014  001226          TST14:  MOV     #14,TSTNO
012146  012737  012230  001216                  MOV     #TST15,NEXT
012154  005077  175120                          CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
012160  012737  000300  177776                  MOV     #300,PS                 ;TO LEVEL 6.
012166  012777  012222  175110                  MOV     #1$,@MC.VEC             ;SET UP INTERRUPT SERVICE ADDRESS
012174  012777  000300  175104                  MOV     #300,@MC.LVL            ;SET UP INTERRUPT SERVICE LEVEL
012202  012777  000100  175070                  MOV     #INTENA,@MC.CSR         ;SET INTERRUPT ENABLE
012210  052777  000200  175062                  BIS     #DONE,@MC.CSR           ;GENERATE INTERRUPT
012216  000240                                  NOP                             ;DELAY FOR INTERRUPT
012220  000402                                  BR      2$                      ;NO INTERRUPT, CONTINUE
012222  022626                          1$:     POP2SP                          ;RESTORE STACK
012224  104003                                  HLT     3                       ;INTERRUPT OCCURED, ERROR
012226  104400                          2$:     SCOPE                           ;CHECK FOR ITERATION, LOOP
```

```

                                             ;************************* TEST 15 ********************************
                                             ;*VERIFY THAT NO INTERRUPT OCCURS WITH
                                             ;*''INTERRUPT ENABLE'' SET AND 'DONE'' SET AT PRIORITY 5.
                                             ;;*****************************************************************


                                     ;  TEST 15
                                     ;--------------
012230  012737  000015  001226       TST15:  MOV     #15,TSTNO
012236  012737  012320  001216               MOV     #TST16,NEXT
012244  005077  175030                       CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
012250  012737  000240  177776               MOV     #240,PS                 ;TO LEVEL 5.
012256  012777  012312  175020               MOV     #1$,@MC.VEC             ;SET UP INTERRUPT SERVICE ADDRESS
012264  012777  000240  175014               MOV     #240,@MC.LVL            ;SET UP INTERRUPT SERVICE LEVEL
012272  012777  000100  175000               MOV     #INTENA,@MC.CSR         ;SET INTERRUPT ENABLE
012300  052777  000200  174772               BIS     #DONE,@MC.CSR           ;GENERATE INTERRUPT
012306  000240                               NOP                             ;DELAY FOR INTERRUPT
012310  000402                               BR      2$                      ;NO INTERRUPT, CONTINUE
012312  022626                       1$:     POP2SP                          ;RESTORE STACK
012314  104003                               HLT     3                       ;INTERRUPT OCCURED, ERROR
012316  104400                       2$:     SCOPE                           ;CHECK FOR ITERATION, LOOP

                                             ;************************* TEST 16 ********************************
                                             ;*VERIFY THAT NO INTERRUPT OCCURS WITH
                                             ;*''INTERRUPT ENABLE'' SET AND 'DONE'' SET AT PRIORITY 4.
                                             ;;*****************************************************************


                                     ;  TEST 16
                                     ;--------------
012320  012737  000016  001226       TST16:  MOV     #16,TSTNO
012326  012737  012410  001216               MOV     #TST17,NEXT
012334  005077  174740                       CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
012340  012737  000200  177776               MOV     #200,PS                 ;TO LEVEL 4.
012346  012777  012402  174730               MOV     #1$,@MC.VEC             ;SET UP INTERRUPT SERVICE ADDRESS
012354  012777  000200  174724               MOV     #200,@MC.LVL            ;SET UP INTERRUPT SERVICE LEVEL
012362  012777  000100  174710               MOV     #INTENA,@MC.CSR         ;SET INTERRUPT ENABLE
012370  052777  000200  174702               BIS     #DONE,@MC.CSR           ;GENERATE INTERRUPT
012376  000240                               NOP                             ;DELAY FOR INTERRUPT
012400  000402                               BR      2$                      ;NO INTERRUPT, CONTINUE
012402  022626                       1$:     POP2SP                          ;RESTORE STACK
012404  104003                               HLT     3                       ;INTERRUPT OCCURED, ERROR
012406  104400                       2$:     SCOPE                           ;CHECK FOR ITERATION, LOOP
```

```

                                                     ;*********************** TEST 17 ****************************
                                                     ;*VERIFY THAT AN INTERRUPT OCCURS WITH ''INTERRUPT
                                                     ;*ENABLE'' SET AND ''DONE'' SET AT PRIORITY 0.
                                                     ;;**********************************************************

                                             ;  TEST 17
                                             ;--------------
012410  012737  000017  001226               TST17:  MOV     #17,TSTNO
012416  012737  012476  001216                       MOV     #TST20,NEXT
012424  005077  174650                               CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
012430  012777  012472  174646                       MOV     #1$,@MC.VEC             ;SET UP INTERRUPT SERVICE ADDRESS
012436  005077  174644                               CLR     @MC.LVL                 ;SET UP INTERRUPT SERVICE PRIORITY
012442  012737  000000  177776                       MOV     #0,PS                   ;SET PROCESSOR PRIORITY TO LEVEL 0.
012450  012777  000100  174622                       MOV     #INTENA,@MC.CSR         ;SET INTERRUPT ENABLE
012456  052777  000200  174614                       BIS     #DONE,@MC.CSR           ;GENERATE INTERRUPT
012464  000240                                       NOP                             ;WAIT FOR INTERRUPT
012466  104004                                       HLT     4                       ;NO INTERRUPT, ERROR.
012470  000401                                       BR      2$                      ;CONTINUE
012472  022626                               1$:     POP2SP                          ;INTERRUPT OCCURED, RESTORE STACK
012474  104400                               2$:     SCOPE                           ;CHECK FOR INTERATIONS, LOOP.

                                                     ;*********************** TEST 20 ****************************
                                                     ;*VERIFY THAT AN INTERRUPT OCCURS WITH ''INTERRUPT
                                                     ;*ENABLE'' SET AND ''DONE'' SET AT PRIORITY 1.
                                                     ;;**********************************************************

                                             ;  TEST 20
                                             ;--------------
012476  012737  000020  001226               TST20:  MOV     #20,TSTNO
012504  012737  012564  001216                       MOV     #TST21,NEXT
012512  005077  174562                               CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
012516  012777  012560  174560                       MOV     #1$,@MC.VEC             ;SET UP INTERRUPT SERVICE ADDRESS
012524  005077  174556                               CLR     @MC.LVL                 ;SET UP INTERRUPT SERVICE PRIORITY
012530  012737  000040  177776                       MOV     #40,PS                  ;SET PROCESSOR PRIORITY TO LEVEL 1.
012536  012777  000100  174534                       MOV     #INTENA,@MC.CSR         ;SET INTERRUPT ENABLE
012544  052777  000200  174526                       BIS     #DONE,@MC.CSR           ;GENERATE INTERRUPT
012552  000240                                       NOP                             ;WAIT FOR INTERRUPT
012554  104004                                       HLT     4                       ;NO INTERRUPT, ERROR.
012556  000401                                       BR      2$                      ;CONTINUE
012560  022626                               1$:     POP2SP                          ;INTERRUPT OCCURED, RESTORE STACK
012562  104400                               2$:     SCOPE                           ;CHECK FOR INTERATIONS, LOOP.
```

```

                                        ;************************ TEST 21 *****************************
                                        ;*VERIFY THAT AN INTERRUPT OCCURS WITH ''INTERRUPT
                                        ;*ENABLE'' SET AND 'DONE'' SET AT PRIORITY 2.
                                        ;:*************************************************************

                                  ;  TEST 21
                                  ;--------------
012564  012737  000021  001226    TST21:  MOV     #21,TSTNO
012572  012737  012652  001216            MOV     #TST22,NEXT
012600  005077  174474                    CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
012604  012777  012646  174472            MOV     #1$,@MC.VEC             ;SET UP INTERRUPT SERVICE ADDRESS
012612  005077  174470                    CLR     @MC.LVL                 ;SET UP INTERRUPT SERVICE PRIORITY
012616  012737  000100  177776            MOV     #100,PS                 ;SET PROCESSOR PRIORITY TO LEVEL 2.
012624  012777  000100  174446            MOV     #INTENA,@MC.CSR         ;SET INTERRUPT ENABLE
012632  052777  000200  174440            BIS     #DONE,@MC.CSR           ;GENERATE INTERRUPT
012640  000240                            NOP                             ;WAIT FOR INTERRUPT
012642  104004                            HLT     4                       ;NO INTERRUPT, ERROR.
012644  000401                            BR      2$                      ;CONTINUE
012646  022626                    1$:     POP2SP                          ;INTERRUPT OCCURED, RESTORE STACK
012650  104400                    2$:     SCOPE                           ;CHECK FOR INTERATIONS, LOOP.

                                        ;************************ TEST 22 *****************************
                                        ;*VERIFY THAT AN INTERRUPT OCCURS WITH ''INTERRUPT
                                        ;*ENABLE'' SET AND 'DONE'' SET AT PRIORITY 3.
                                        ;:*************************************************************

                                  ;  TEST 22
                                  ;--------------
012652  012737  000022  001226    TST22:  MOV     #22,TSTNO
012660  012737  012740  001216            MOV     #TST23,NEXT
012666  005077  174406                    CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
012672  012777  012734  174404            MOV     #1$,@MC.VEC             ;SET UP INTERRUPT SERVICE ADDRESS
012700  005077  174402                    CLR     @MC.LVL                 ;SET UP INTERRUPT SERVICE PRIORITY
012704  012737  000140  177776            MOV     #140,PS                 ;SET PROCESSOR PRIORITY TO LEVEL 3.
012712  012777  000100  174360            MOV     #INTENA,@MC.CSR         ;SET INTERRUPT ENABLE
012720  052777  000200  174352            BIS     #DONE,@MC.CSR           ;GENERATE INTERRUPT
012726  000240                            NOP                             ;WAIT FOR INTERRUPT
012730  104004                            HLT     4                       ;NO INTERRUPT, ERROR.
012732  000401                            BR      2$                      ;CONTINUE
012734  022626                    1$:     POP2SP                          ;INTERRUPT OCCURED, RESTORE STACK
012736  104400                    2$:     SCOPE                           ;CHECK FOR INTERATIONS, LOOP.
```

```
                                        ;************************* TEST 23 *********************************
                                        ;*VERIFY THAT ALL LINE NUMBERS CAN BE WRITTEN INTO AND
                                        ;*READ BACK FROM LINE COUNTER
                                        ;;*******************************************************************

                                ;  TEST 23
                                ;--------------
012740  012737  000023  001226  TST23:  MOV     #23,TSTNO
012746  012737  013026  001216          MOV     #TST24,NEXT
012754  012737  013002  001220          MOV     #1$,LOCK
012762  013703  007300                  MOV     MC.CSR,R3               ;SET POINTER
012766  005013                          CLR     (R3)                    ;CLEAR CONTROL STATUS REGISTER
012770  005037  177776                  CLR     PS                      ;ENABLE INTERRUPTS
012774  005005                          CLR     R5                      ;CLEAR EXPECTED LINE NUMBER
012776  012700  000020                  MOV     #16.,R0                 ;SET UP TO TEST 16 LINE NUMBERS
013002  010513                  1$:     MOV     R5,(R3)                 ;SET LINE NUMBER
013004  011304                          MOV     (R3),R4                 ;READ BACK LINE NUMBER
013006  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED
013010  001401                          BEQ     2$                      ;LINE NUBMERS THE SAME
013012  104002                          HLT     2                       ;LINE NUMBERS DIFFERENT, ERROR
013014  104401                  2$:     SCOP1                           ;CHECK FOR DATA FREEZE
013016  005205                          INC     R5                      ;UPDATE LINE COUNT
013020  005300                          DEC     R0                      ;UPDATE LINE NUMBER
013022  001367                          BNE     1$                      ;CONTINUE
013024  104400                          SCOPE                           ;CHECK FOR ITERATION, LOOP

                                        ;************************* TEST 24 *********************************
                                        ;*USING ''STEP'' MODE, VERIFY THAT THE
                                        ;*LINE COUNTER CAN BE STEPPED THRU ALL STATES.
                                        ;;*******************************************************************

                                ;  TEST 24
                                ;--------------
013026  012737  000024  001226  TST24:  MOV     #24,TSTNO
013034  012737  013124  001216          MOV     #TST25,NEXT
013042  012737  013054  001220          MOV     #1$,LOCK
013050  013703  007300                  MOV     MC.CSR,R3               ;SET POINTER
013054  005037  177776          1$:     CLR     PS                      ;ENABLE INTERRUPTS
013060  005013                          CLR     (R3)                    ;CLEAR CONTROL STATUS REGISTER
013062  005005                          CLR     R5                      ;CLEAR EXPECTED LINE COUNT
013064  012700  000020                  MOV     #16.,R0                 ;SET UP TO TEST 16 VALUES
013070  012713  000017                  MOV     #17,(R3)                ;FIRST VALUE =0
013074  052713  000400          2$:     BIS     #STEP,(R3)              ;STEP LINE COUNTER
013100  104414                          DELAY
013102  011304                          MOV     (R3),R4                 ;READ LINE COUNTER
013104  020504                          CMP     R5,R4                   ;COMPARE EXPECTED AND
013106  001401                          BEQ     3$                      ;RECEIVED LINE NUMBERS
013110  104002                          HLT     2                       ;LINE COUNTER ERROR
013112  104401                  3$:     SCOP1                           ;CHECK FOR DATA FREEZE
013114  005205                          INC     R5                      ;UPDATE EXPECTED LINE NUMBER
013116  005300                          DEC     R0
013120  001365                          BNE     2$
013122  104400                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```
                                                     ;************************* TEST 25 ********************************
                                                     ;*WRITE 1'S INTO ALL SCANNER MEMORY LOCATIONS.
                                                     ;*VERIFY THAT ALL LOCATIONS HAVE BEEN WRITTEN
                                                     ;*TO 1'S.
                                                     ;*VERIFY THAT ''CLEAR SCAN'' CLEARS ALL SCANNER
                                                     ;*MEMORY LOCATIONS.
                                                     ;:***************************************************************

                                        ;  TEST 25
                                        ;--------------
013124  012737  000025  001226  TST25:  MOV     #25,TSTNO
013132  012737  013326  001216          MOV     #TST26,NEXT
013140  012737  013152  001220          MOV     #1$,LOCK
013146  013703  007300                  MOV     MC.CSR,R3               ;SET POINTER
013152  012713  002000          1$:     MOV     #CLRMUX,(R3)            ;CLEAR CONTROL STATUS REGISTER
013156  005037  177776                  CLR     PS                      ;ENABLE INTERRUPTS
013162  012700  000020                  MOV     #16.,R0                 ;SET UP TO TEST 16 LOCATIONS
013166  052713  001017                  BIS     #MAINT+17,(R3)          ;SET MAINTEANCE MODE
013172  052713  000400          2$:     BIS     #STEP,(R3)              ;SET LINE COUNTER THRU ALL
013176  005300                          DEC     R0                      ;STATES, WRITING 1'S INTO
013200  001374                          BNE     2$                      ;ALL MEMORY WORDS
013202  012700  000020                  MOV     #16.,R0                 ;SET UP TO TEST 16 WORDS
013206  012705  070000                  MOV     #70000,R5               ;SET UP EXPECTED STATUS REGISTER
013212  012713  000017                  MOV     #17,(R3)                ;START WITH LINE 0
013216  052713  000400          3$:     BIS     #STEP,(R3)              ;ACCESS SCANNER MEMORY
013222  104414                          DELAY
013224  011304                          MOV     (R3),R4                 ;READ DATA
013226  020504                          CMP     R5,R4                   ;COMPARE EXPECTED AND RECEIVED
013230  001401                          BEQ     4$                      ;DATA
013232  104002                          HLT     2                       ;CONTROL STATUS OR MEMORY ERROR
013234  104401                  4$:     SCOP1                           ;CHECK FOR DATA FREEZE
013236  005205                          INC     R5                      ;UPDATE EXPECTED STATUS
013240  005300                          DEC     R0                      ;UPDATE LINE COUNT
013242  001365                          BNE     3$                      ;CONTINUE
013244  012737  013252  001220          MOV     #5$,LOCK                ;SET RETURN
013252  012713  004000          5$:     MOV     #CLRSCN,(R3)            ;SET ''CLEAR SCAN''
013256  032713  000020                  BIT     #BUSY,(R3)              ;WAIT FOR ''CLEAR CYCLES''
013262  001375                          BNE     .-4
013264  012700  000020                  MOV     #16.,R0                 ;SET UP TO TEST 16 MEMORY
013270  005005                          CLR     R5                      ;LOCATIONS
013272  012713  000017                  MOV     #17,(R3)                ;FIRST TO BE TESTED=0
013276  052713  000400          6$:     BIS     #STEP,(R3)              ;ACCESS SEANNER MEMORY
013302  104414                          DELAY
013304  011304                          MOV     (R3),R4                 ;READ DATA
013306  020504                          CMP     R5,R4                   ;COMPARE EXPECTED AND RECEIVED
013310  001402                          BEQ     7$                      ;DATA
013312  104002                          HLT     2                       ;CONTROL  STATUS OF MEMORY ERROR
013314  104401                          SCOP1                           ;CHECK FOR DATA FREEZE
013316  005205                  7$:     INC     R5                      ;UPDATE EXPECTED DATA
013320  005300                          DEC     R0                      ;UPDATE LINE COUNT
013322  001365                          BNE     6$                      ;CONTTINUE
013324  104400                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```
                                          ;************************ TEST 26 ******************************
                                          ;*WRITE 1'S INTO SELECTED SCANNER MEMORY LOCATION.
                                          ;*VERIFY THAT ONLY SELECTED LOCATION WAS WRITTEN INTO.
                                          ;:***************************************************************

                                 ;  TEST 26
                                 ;---------------
013326  012737  000026  001226   TST26:  MOV     #26,TSTNO
013334  012737  013510  001216           MOV     #TST27,NEXT
013342  012737  013354  001220           MOV     #1$,LOCK
013350  013703  007300                   MOV     MC.CSR,R3                  ;SET POINTER
013354  005013                   1$:     CLR     (R3)                       ;CLEAR CONTROL STATUS REGISTER
013356  005037  177776                   CLR     PS                         ;ENABLE INTERRUPTS
013362  012700  000020                   MOV     #16.,R0                    ;SET UP TO TEST 16 ADDRESSES
013366  012702  000017                   MOV     #17,R2                     ;FIRST ADDRESS TO BE TESTED=0
013372  012713  004000           2$:     MOV     #CLRSCN,(R3)               ;CLEAR ACANNER MEMORY
013376  032713  000020                   BIT     #BUSY,(R3)                 ;WAIT FOR CLEAR CYCLE
013402  001375                           BNE     .-4
013404  012713  001000                   MOV     #MAINT,(R3)                ;SET 'MAINTENANCE MODE''
013410  050213                           BIS     R2,(R3)                    ;SET LINE COUNTER TO TEST ADDRESS-1
013412  052713  000400                   BIS     #STEP,(R3)                 ;WRITE 1'S INTO TEST ADDRESS
013416  042713  001000                   BIC     #MAINT,(R3)                ;CLEAR 'MAINTENANCE MODE''
013422  012737  000020  001252           MOV     #16.,TEMP3                 ;SET UP TO TEST ALL 16
013430  012713  000017                   MOV     #17,(R3)                   ;SCANNER MEMORY LOCATIONS
013434  005202                           INC     R2
013436  005001                           CLR     R1
013440  052713  000400           3$:     BIS     #STEP,(R3)                 ;ACCESS SCANNER MEMORY
013444  104414                           DELAY
013446  111304                           MOVB    (R3),R4                    ;READ CONPENTS OF MEMORY
013450  010105                           MOV     R1,R5                      ;SET UP EXPECTED CONTENTS
013452  120402                           CMPB    R4,R2                      ;OF SCANNER MEMORY
013454  001002                           BNE     4$
013456  052705  070000                   BIS     #70000,R5
013462  020405                   4$:     CMP     R4,R5                      ;COMPARE EXPECTED AND RECEIVED
013464  001402                           BEQ     5$                         ;VALUES
013466  104002                           HLT     2                          ;SCANNER MEMORY ERROR
013470  104401                           SCOP1                              ;CHECK FOR DATA FREEZE
013472  005201                   5$:     INC     R1
013474  005337  001252                   DEC     TEMP3                      ;TEST NEXT SCANNEB LOCATION
013500  001357                           BNE     3$
013502  005300                           DEC     R0                         ;UPDATE LINE COUNT
013504  001332                           BNE     2$
013506  104400                           SCOPE                              ;CHECK FOR ITERATION, LOOP
```

```
                                        ;************************* TEST 27 ****************************
                                        ;*WITH ALL SCANNER MEMORY LOCATIONS SET TO 1'S,
                                        ;*WRITE 0'S INTO SELECTED LOCATION
                                        ;*VERIFY THAT ONLY SELECTED LOCATION WAS CLEARED.
                                        ;;****************************************************************

                                ;  TEST 27
                                ;--------------
013510  012737  000027  001226  TST27:  MOV     #27,TSTNO
013516  012737  013674  001216          MOV     #TST30,NEXT
013524  012737  013554  001220          MOV     #2$,LOCK
013532  013703  007300                  MOV     MC.CSR,R3               ;SET POINTER
013536  005013                  1$:     CLR     (R3)                    ;CLEAR CONTROL STATUS REGISTER
013540  005037  177776                  CLR     PS                      ;ENABLE INTERRUPTS
013544  012700  000020                  MOV     #16.,R0                 ;SET UP TO TEST 16 ADDRESSES
013550  012702  000017                  MOV     #17,R2                  ;FIRST ADDRESS TO BE TESTED=0
013554  012737  000020  001252  2$:     MOV     #16.,TEMP3              ;WRITE 1'S INTO ALL SCANNER
013562  012713  001017                  MOV     #MAINT+17,(R3)   ;MEMORY LOCATIONS
013566  052713  000400          3$:     BIS     #STEP,(R3)
013572  005337  001252                  DEC     TEMP3
013576  001373                          BNE     3$
013600  010213                          MOV     R2,(R3)                 ;SET LINE COUNTER TO TEST ADDRESS-1
013602  052713  000400                  BIS     #STEP,(R3)              ;WRITE 0'S INTO TEST ADDRESS
013606  012737  000020  001252          MOV     #16.,TEMP3              ;SET UP TO TEST ALL 16
013614  012713  000017                  MOV     #17,(R3)                ;SCANNER MEMORY LOCATIONS
013620  005202                          INC     R2
013622  005001                          CLR     R1
013624  052713  000400          4$:     BIS     #STEP,(R3)              ;ACESS SCANNER MEMORY
013630  104414                          DELAY
013632  111304                          MOVB    (R3),R4                 ;READ CONTENTS OF MEMORY
013634  010105                          MOV     R1,R5                   ;SET UP EXPECTED CONTENTS
013636  120402                          CMPB    R4,R2                   ;OF SCANNER MEIORY
013640  001002                          BNE     5$
013642  052705  070000                  BIS     #70000,R5
013646  020405                  5$:     CMP     R4,R5                   ;COMPARE EXPECTED AND
013650  001402                          BEQ     6$                      ;RECEIVED VALUES
013652  104002                          HLT     2                       ;SCANNER MEMORY ERROR
013654  104401                          SCOP1                           ;CHECK FOR DATA FREEZE
013656  005201                  6$:     INC     R1
013660  005337  001252                  DEC     TEMP3                   ;TEST NEXT SCANNER LOCATION
013664  001357                          BNE     4$
013666  005300                          DEC     R0                      ;UPDATE ADDRESS COUNT
013670  001331                          BNE     2$
013672  104400                          SCOPE                           ;CHECK FOR ITERATION, LOOP
```

```
                                        ;************************* TEST 30 *********************************
                                        ;*VERIFY THAT ''CLEAR MULTIPLXER'' CLEARS ALL MULTIPLEXER
                                        ;*FUNCTION FLIP-FLOPS
                                        ;;*****************************************************************

                                ;  TEST 30
                                ;--------------
013674  012737  000030  001226  TST30:  MOV     #30,TSTNO
013702  012737  014052  001216          MOV     #TST31,NEXT
013710  012737  013762  001220          MOV     #3$,LOCK
013716  013703  007300                  MOV     MC.CSR,R3               ;SET POINTER
013722  005013                  1$:     CLR     (R3)                    ;CLEAR CONTROL REGISTER
013724  005037  177776                  CLR     PS                      ;ENABLE INTERRUPTS
013730  012700  000020                  MOV     #16.,R0                 ;SET UP TO TEST 16 LINES
013734  012777  000017  173340  2$:     MOV     #17,@MC.LSR             ;WRITE 1S INTO  ALL MULTIPLEXER
013742  052713  000400                  BIS     #STEP,(R3)              ;FUNCTION FLIPFLOPS
013746  005300                          DEC     R0
013750  001371                          BNE     2$
013752  005037  001252                  CLR     TEMP3                   ;SET UP FOR 16 LINES
013756  012700  000020                  MOV     #16.,R0
013762  012713  002000          3$:     MOV     #CLRMUX,(R3)            ;CLEAR MULTIPLEXER
013766  013713  001252          4$:     MOV     TEMP3,(R3)                      ;SELECT LINE
013772  017704  173304                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
013776  005005                          CLR     R5                      ;EXPECT 0S
014000  005704                          TST     R4                      ;WAS LINE STATUS REGISTER CLEARED
014002  001402                          BEQ     5$
014004  104002                          HLT     2                       ;LINE STATUS ERROR
014006  104401                          SCOP1                           ;CHECK FOR LOOP ON SAME DATA
014010  005205                  5$:     INC     R5                      ;EXPECT LINE ENABLE
014012  052777  000001  173262          BIS     #LINENA,@MC.LSR         ;SET LINE ENABLE ON SELECTED LINE
014020  017704  173256                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
014024  020504                          CMP     R5,R4                   ;IS ANYTHING BUT LINE ENABLE SET
014026  001402                          BEQ     6$
014030  104002                          HLT     2                       ;LINE STATUS ERROR
014032  104401                          SCOP1                           ;CHECK FOR LOOP ON SAME DATA
014034  005237  001252          6$:     INC     TEMP3                   ;UPDATE LINE NUMBER
014040  005077  173236                  CLR     @MC.LSR                 ;CLEAR CURRENT LINE
014044  005300                          DEC     R0                      ;CONTINUE IF ALL LINES NOT
014046  001347                          BNE     4$                      ;TESTED
014050  104400                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```

                                                 ;************************ TEST 31 ********************************
                                                 ;*WRITE 1'S INTO ALL SCANNER MEMORY LOCATIONS
                                                 ;*SET 'LINE ENABLE FOR ALL LINES
                                                 ;*VERIFY THAT AN INTERRUPT OCCURS FOR EACH LINE
                                                 ;:*************************************************************

                                 ;  TEST 31
                                 ;---------------
014052  012737  000031  001226   TST31:  MOV     #31,TSTNO
014060  012737  014304  001216           MOV     #TST32,NEXT
014066  012737  014100  001220           MOV     #1$,LOCK
014074  013703  007300                   MOV     MC.CSR,R3                     ;SET POINTER
014100  012713  002000           1$:     MOV     #CLRMUX,(R3)                  ;CLEAR ALL MULTIPLEXER FLIPFLOPS
014104  005013                           CLR     (R3)                          ;CLEAR CONTROL REGISTER
014106  005037  177776                   CLR     PS                            ;ENABLE INTERRUPTS
014112  012700  000020                   MOV     #16.,R0                       ;SET UP TO WRITE 1'S INTO
014116  012713  001017                   MOV     #MAINT+17,(R3)                ;ALL SCANNER MEMORY LOCATION
014122  052713  000400           2$:     BIS     #STEP,(R3)                    ;WRITE A LOCATION
014126  012777  000001  173146           MOV     #LINENA,@MC.LSR               ;LET 'LINE ENABLE''
014134  005300                           DEC     R0
014136  001371                           BNE     2$
014140  012705  070340                   MOV     #70340,R5                     ;EXPECT 'DONE''+''SCNENA''+''COF''+''CSF''+''SECRXF''
014144  012777  014254  173132           MOV     #4$,@MC.VEC                   ;SET UP LOCAL INTERRUPT SERVICE
014152  013777  177776  173126           MOV     PS,@MC.LVL                    ;SERVICE AT LEVEL 7
014160  012700  000020                   MOV     #16.,R0
014164  012713  000117                   MOV     #INTENA+17,(R3)               ;SET INTERRUPT ENABLE
014170  012737  000340  177776   3$:     MOV     #340,PS                       ;LOCK OUT INTERRUPTS
014176  052713  000040                   BIS     #SCNENA,(R3)                  ;START SCANNER
014202  005037  177776                   CLR     PS                            ;ENABLE INTERRUPTS
014206  005037  001270                   CLR     SAVR4
014212  105713                           TSTB    (R3)                          ;WAIT FOR DONE
014214  100410                           BMI     .+22
014216  104414                           DELAY
014220  000240                           NOP
014222  000240                           NOP
014224  062737  000001  001270           ADD     #1,SAVR4
014232  001367                           BNE     .-20
014234  104006                           HLT     6
014236  012737  000340  177776           MOV     #340,PS                       ;INTERRUPT DID NOT OCCUR
014244  011304                           MOV     (R3),R4                       ;ERROR
014246  104004                           HLT     4                             ;CONTROL STATUS ERROR
014250  104401                           SCOP1                                 ;CHECK FOR LOOP ON SAME DATA
014252  000406                           BR      5$
014254  022626                   4$:     POP2SP                                ;INTERRUPT OCCURED, REPOSITION STACK
014256  011304                           MOV     (R3),R4                       ;READ CONTROL STATUS
014260  020504                           CMP     R5,R4                         ;ARE EXPECTED AND RECEIVED
014262  001402                           BEQ     5$                            ;REGISTERS THE SAME
014264  104002                           HLT     2                             ;NO, LINE STATUS ERROR
014266  104401                           SCOP1                                 ;CHECK FOR LOOP WITH CURRENT DATA
014270  042713  000240           5$:     BIC     #SCNENA+DONE,(R3)             ;CLEAR SCAN ENABLE AND DONE
014274  005205                           INC     R5                            ;UPDATE EXPECTED RESULT
014276  005300                           DEC     R0                            ;CONTINUE IF NOT DONE
014300  001333                           BNE     3$
014302  104400                           SCOPE                                 ;CHECK FOR ITERATIONS, LOOP
```

```
                                             ;************************** TEST 32 *******************************
                                             ;*WRITE 1'S INTO ALL MULTIPLEXER FUNCTION FLIP-FLOPS
                                             ;*CLEAR SCANNER MEMORY
                                             ;*VERIFY THAT AN INTERRUPT OCCURS FOR EACH LINE
                                             ;*THIS TEST IS DONE IF THE H861 TURN AROUND IS USED.
                                             ;:*****************************************************************

                                     ;  TEST 32
                                     ;--------------
014304  012737  000032  001226       TST32:  MOV     #32,TSTNO
014312  012737  014650  001216               MOV     #TST33,NEXT
014320  012737  014436  001220               MOV     #1$,LOCK
014326  005000                               CLR     R0
014330  005737  001422                       TST     L00.03
014334  100402                               BMI     68$
014336  062700  000004                       ADD     #4,R0
014342  005737  001424               68$:    TST     L04.07
014346  100402                               BMI     69$
014350  062700  000004                       ADD     #4,R0
014354  005737  001426               69$:    TST     L08.11
014360  100402                               BMI     70$
014362  062700  000004                       ADD     #4,R0
014366  005737  001430               70$:    TST     L12.15
014372  100402                               BMI     71$
014374  062700  000004                       ADD     #4,R0
014400  005700                       71$:    TST     R0
014402  001001                               BNE     .+4
014404  000000                               HALT                            ;TEST CAN NOT RUN WITH NO LINE CARDS!!
014406  010037  007276                       MOV     R0,TOTAL
014412  005737  007260                       TST     TURFLG
014416  001405                               BEQ     65$
014420  013737  001216  001214               MOV     NEXT,RETURN
014426  000177  164562                       JMP     @RETURN
014432  013703  007300               65$:    MOV     MC.CSR,R3                 ;SET POINTER
014436  012700  000020               1$:     MOV     #16.,R0                   ;WRITE 1S INTO ALL
014442  012713  002000                       MOV     #CLRMUX,(R3)              ;CLEAR MULTIPLEXER
014446  005013                               CLR     (R3)                      ;MULTIPLEXER FUNCTION
014450  005037  177776                       CLR     PS                        ;ENABLE TELETYPE INTERRUPTS
014454  012777  000017  172620       2$:     MOV     #17,@MC.LSR               ;FLIPFLOPS
014462  052713  000400                       BIS     #STEP,(R3)
014466  005300                               DEC     R0
014470  001371                               BNE     2$
014472  012713  004000                       MOV     #CLRSCN,(R3)              ;CLEAR SCANNER MEMORY
014476  032713  000020                       BIT     #BUSY,(R3)                ;WAIT FOR CLEAR CYCLE TO COMPLETE
014502  001375                               BNE     .-4
014504  013700  007276                       MOV     TOTAL,R0
014510  012705  170340                       MOV     #170340,R5                ;FIRST EXPECTED RESULT
014514  012777  014620  172562               MOV     #4$,@MC.VEC               ;SET UP LOCAL INTERRUPT RETURN
014522  013777  177776  172556               MOV     PS,@MC.LVL
014530  012713  000117                       MOV     #INTENA+17,(R3)           ;SET INTERRUPT ENABLE
014534  012737  000340  177776       3$:     MOV     #340,PS                   ;LOCK OUT INTERRUPTS
014542  052713  000040                       BIS     #SCNENA,(R3)              ;START SCANNER
014546  005037  177776                       CLR     PS                        ;ENABLE INTERRUPTS
014552  005037  001270                       CLR     SAVR4
014556  105713                               TSTB    (R3)                      ;WAIT FOR DONE
014560  100410                               BMI     .+22
```

```
014562  104414                          DELAY
014564  000240                          NOP
014566  000240                          NOP
014570  062737  000001  001270          ADD     #1,SAVR4
014576  001367                          BNE     .-20
014600  104006                          HLT     6
014602  012737  000340  177776          MOV     #340,PS                         ;LOCK OUT INTERRUPTS
014610  011304                          MOV     (R3),R4                         ;READ CONTROL STATUS
014612  104004                          HLT     4                               ;INTERRUPT DID NOT OCCUR
014614  104401                          SCOP1                                   ;CHECK FOR LOOP ON CURRENT DATA
014616  000406                          BR      5$                              ;CONTINUE
014620  022626                  4$:     POP2SP                                  ;INTERRUPT OCCURED, RESTORE STACK
014622  011304                          MOV     (R3),R4                         ;READ CONTROL STATUS REGISTER
014624  020504                          CMP     R5,R4                           ;COMPARE TO EXPECTED RESULT
014626  001402                          BEQ     5$
014630  104002                          HLT     2                               ;CONTROL STATUS ERROR
014632  104401                          SCOP1                                   ;CHECK FOR LOOP ON CURRENT DATA
014634  042713  000240          5$:     BIC     #SCNENA+DONE,(R3)               ;CLEAR SCAN ENABLE AND DONE
014640  005205                          INC     R5                              ;UPDATE EXPECTED RESULT
014642  005300                          DEC     R0                              ;CONTINUE IF ALL
014644  001333                          BNE     3$                              ;LINES NOT TESTED
014646  104400                          SCOPE                                   ;CHECK FOR ITERATIONS, LOOP
```

```
                                         ;************************* TEST 33 ******************************
                                         ;*VERIFY THAT LINE ENABLE FUNCTION FLIP-FLOP CAN
                                         ;*BE SET AND CLEARED FOR SELECTED LINE
                                         ;*THIS TEST IS DONE IF THE H325 TURN AROUND IS USED
                                         ; MODEM CONTROL LINES *MUST* BE CONTIGUOUS FROM LINE 00.
                                         ;;*****************************************************************


                                ;  TEST 33
                                ;--------------
014650  012737  000033  001226  TST33:   MOV     #33,TSTNO
014656  012737  015050  001216           MOV     #TST34,NEXT
014664  005737  007260                   TST     TURFLG                    ;TURN AROUND H861 OR H325?
014670  001005                           BNE     1$                        ;BR IF H325
014672  013737  001216  001214           MOV     NEXT,RETURN
014700  000177  164310                   JMP     @RETURN
014704  005077  172370          1$:      CLR     @MC.CSR                   ;CLEAR CONTROL STATUS REGISTER
014710  005037  177776                   CLR     PS                        ;ZERO PSW.
014714  013701  007262                   MOV     LINE,R1                   ;SET LINE IMAGE
014720  012777  002000  172352  2$:      MOV     #CLRMUX,@MC.CSR           ;CLEAR MUX
014726  012702  000020                   MOV     #16.,R2                   ;SET FOR 16 LINES
014732  010177  172342                   MOV     R1,@MC.CSR                ;SELECT LINE TO BE TESTED
014736  012777  000001  172336           MOV     #LINENA,@MC.LSR           ;SET LINE ENABLE FUNCTION FLIP-FLOP
014744  005077  172330                   CLR     @MC.CSR                   ;ZERO CSR
014750  005005                  3$:      CLR     R5                        ;SET EXPECTED
014752  017704  172324                   MOV     @MC.LSR,R4                ;READ LINE STATUS REGISTER
014756  117703  172316                   MOVB    @MC.CSR,R3                ;READ CONTROL STATUS REGISTER
014762  042703  177760                   BIC     #^C<17>,R3                ;CLEAR UNWANTED BITS
014766  020103                           CMP     R1,R3                     ;IF LINE NUMBER=SELECTED LINE NUMBER,
014770  001002                           BNE     4$                        ;EXCEPT LINE ENABLE FUNCTION FLIP FLOP
014772  012705  000001                   MOV     #LINENA,R5                ;SET ''GOOD''
                                                                           ;TO BE SET
014776  020504                  4$:      CMP     R5,R4                     ;COMPARE EXPECTED AND RECEIVED
015000  001401                           BEQ     5$                        ;RESULTS
015002  104001                           HLT     1                         ;R5=EXPECTED R4=FOUND
015004  052777  000400  172266  5$:      BIS     #STEP,@MC.CSR             ;EXAMINE NEXT LINE
015012  005302                           DEC     R2                        ;ALL LINES DONE?
015014  001355                           BNE     3$                        ;BR IF NO
015016  005005                           CLR     R5                        ;CLEAR ''GOOD''
015020  010177  172254          6$:      MOV     R1,@MC.CSR                ;LOAD LINE
015024  010103                           MOV     R1,R3                     ;SET LINE COUNTER TO SELECTED LINE
015026  005077  172250                   CLR     @MC.LSR                   ;CLEAR LINE ENABLE FLIP FLOP
015032  104414                           DELAY                             ;DELAY FOR CABLE
015034  017704  172242                   MOV     @MC.LSR,R4                ;READ LINE STATUS REGISTER
015040  005704                           TST     R4                        ;WAS LINE ENABLE FUNCTION FLIP FLOP
015042  001401                           BEQ     .+4                       ;CLEARED
015044  104001                           HLT     1                         ;R5=EXPECTED R4=FOUND
015046  104400                  7$:      SCOPE                             ;CHECK FOR ITERATIONS, LOOP
```

```
                                        ;************************** TEST 34 ********************************
                                        ;*VERIFY THAT TERMINAL READY FUNCTION FLIP-FLOP CAN
                                        ;*BE SET AND CLEARED FOR SELECTED LINE
                                        ;*THIS TEST IS DONE IF THE H325 TURN AROUND IS USED
                                        ; MODEM CONTROL LINES *MUST* BE CONTIGUOUS FROM LINE 00.
                                        ;:*******************************************************************

                                ;  TEST 34
                                ;--------------
015050  012737  000034  001226  TST34:  MOV     #34,TSTNO
015056  012737  015250  001216          MOV     #TST35,NEXT
015064  005737  007260                  TST     TURFLG                  ;TURN AROUND H861 OR H325?
015070  001005                          BNE     1$                      ;BR IF H325
015072  013737  001216  001214          MOV     NEXT,RETURN
015100  000177  164110                  JMP     @RETURN
015104  005077  172170          1$:     CLR     @MC.CSR                 ;CLEAR CONTROL STATUS REGISTER
015110  005037  177776                  CLR     PS                      ;ZERO PSW.
015114  013701  007262                  MOV     LINE,R1                 ;SET LINE IMAGE
015120  012777  002000  172152  2$:     MOV     #CLRMUX,@MC.CSR         ;CLEAR MUX
015126  012702  000020                  MOV     #16.,R2                 ;SET FOR 16 LINES
015132  010177  172142                  MOV     R1,@MC.CSR              ;SELECT LINE TO BE TESTED
015136  012777  000002  172136          MOV     #TRMRDY,@MC.LSR         ;SET TERMINAL READY FUNCTION FLIP-FLOP
015144  005077  172130                  CLR     @MC.CSR                 ;ZERO CSR
015150  005005                  3$:     CLR     R5                      ;SET EXPECTED
015152  017704  172124                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
015156  117703  172116                  MOVB    @MC.CSR,R3              ;READ CONTROL STATUS REGISTER
015162  042703  177760                  BIC     #^C<17>,R3              ;CLEAR UNWANTED BITS
015166  020103                          CMP     R1,R3                   ;IF LINE NUMBER=SELECTED LINE NUMBER,
015170  001002                          BNE     4$                      ;EXCEPT TERMINAL READY FUNCTION FLIP FLOP
015172  012705  000002                  MOV     #TRMRDY,R5              ;SET ''GOOD''
                                                                        ;TO BE SET
015176  020504                  4$:     CMP     R5,R4                   ;COMPARE EXPECTED AND RECEIVED
015200  001401                          BEQ     5$                      ;RESULTS
015202  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
015204  052777  000400  172066  5$:     BIS     #STEP,@MC.CSR           ;EXAMINE NEXT LINE
015212  005302                          DEC     R2                      ;ALL LINES DONE?
015214  001355                          BNE     3$                      ;BR IF NO
015216  005005                          CLR     R5                      ;CLEAR ''GOOD''
015220  010177  172054          6$:     MOV     R1,@MC.CSR              ;LOAD LINE
015224  010103                          MOV     R1,R3                   ;SET LINE COUNTER TO SELECTED LINE
015226  005077  172050                  CLR     @MC.LSR                 ;CLEAR TERMINAL READY FLIP FLOP
015232  104414                          DELAY                           ;DELAY FOR CABLE
015234  017704  172042                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
015240  005704                          TST     R4                      ;WAS TERMINAL READY FUNCTION FLIP FLOP
015242  001401                          BEQ     .+4                     ;CLEARED
015244  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
015246  104400                  7$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```
                                                   ;************************** TEST 35 **********************************
                                                   ;*VERIFY THAT REQUEST TO SEND FUNCTION FLIP-FLOP CAN
                                                   ;*BE SET AND CLEARED FOR SELECTED LINE
                                                   ;*THIS TEST IS DONE IF THE H325 TURN AROUND IS USED
                                                   ; MODEM CONTROL LINES *MUST* BE CONTIGUOUS FROM LINE 00.
                                                   ;;*******************************************************************


                                          ;  TEST 35
                                          ;--------------
015250  012737  000035  001226  TST35:  MOV     #35,TSTNO
015256  012737  015450  001216          MOV     #TST36,NEXT
015264  005737  007260                  TST     TURFLG                        ;TURN AROUND H861 OR H325?
015270  001005                          BNE     1$                            ;BR IF H325
015272  013737  001216  001214          MOV     NEXT,RETURN
015300  000177  163710                  JMP     @RETURN
015304  005077  171770          1$:     CLR     @MC.CSR                       ;CLEAR CONTROL STATUS REGISTER
015310  005037  177776                  CLR     PS                            ;ZERO PSW.
015314  013701  007262                  MOV     LINE,R1                       ;SET LINE IMAGE
015320  012777  002000  171752  2$:     MOV     #CLRMUX,@MC.CSR               ;CLEAR MUX
015326  012702  000020                  MOV     #16.,R2                       ;SET FOR 16 LINES
015332  010177  171742                  MOV     R1,@MC.CSR                    ;SELECT LINE TO BE TESTED
015336  012777  000004  171736          MOV     #RS,@MC.LSR                   ;SET REQUEST TO SEND FUNCTION FLIP-FLOP
015344  005077  171730                  CLR     @MC.CSR                       ;ZERO CSR
015350  005005                  3$:     CLR     R5                            ;SET EXPECTED
015352  017704  171724                  MOV     @MC.LSR,R4                    ;READ LINE STATUS REGISTER
015356  117703  171716                  MOVB    @MC.CSR,R3                    ;READ CONTROL STATUS REGISTER
015362  042703  177760                  BIC     #^C<17>,R3                    ;CLEAR UNWANTED BITS
015366  020103                          CMP     R1,R3                         ;IF LINE NUMBER=SELECTED LINE NUMBER,
015370  001002                          BNE     4$                            ;EXCEPT REQUEST TO SEND FUNCTION FLIP FLOP
015372  012705  000004                  MOV     #RS,R5              ;SET ''GOOD''
                                                                              ;TO BE SET
015376  020504                  4$:     CMP     R5,R4                         ;COMPARE EXPECTED AND RECEIVED
015400  001401                          BEQ     5$                            ;RESULTS
015402  104001                          HLT     1                             ;R5=EXPECTED R4=FOUND
015404  052777  000400  171666  5$:     BIS     #STEP,@MC.CSR                 ;EXAMINE NEXT LINE
015412  005302                          DEC     R2                            ;ALL LINES DONE?
015414  001355                          BNE     3$                            ;BR IF NO
015416  005005                          CLR     R5                            ;CLEAR ''GOOD''
015420  010177  171654          6$:     MOV     R1,@MC.CSR                    ;LOAD LINE
015424  010103                          MOV     R1,R3                         ;SET LINE COUNTER TO SELECTED LINE
015426  005077  171650                  CLR     @MC.LSR                       ;CLEAR REQUEST TO SEND FLIP FLOP
015432  104414                          DELAY                                 ;DELAY FOR CABLE
015434  017704  171642                  MOV     @MC.LSR,R4                    ;READ LINE STATUS REGISTER
015440  005704                          TST     R4                            ;WAS REQUEST TO SEND FUNCTION FLIP FLOP
015442  001401                          BEQ     .+4                           ;CLEARED
015444  104001                          HLT     1                             ;R5=EXPECTED R4=FOUND
015446  104400                  7$:     SCOPE                                 ;CHECK FOR ITERATIONS, LOOP
```

```
                                                 ;*************************** TEST 36 **********************************
                                                 ;*VERIFY THAT NEW SYNC (SECTX IF ASYNC LC) FUNCTION FLIP-FLOP CAN
                                                 ;*BE SET AND CLEARED FOR SELECTED LINE
                                                 ;*THIS TEST IS DONE IF THE H325 TURN AROUND IS USED
                                                 ; MODEM CONTROL LINES *MUST* BE CONTIGUOUS FROM LINE 00.
                                                 ;;*********************************************************************

                                         ;  TEST 36
                                         ;---------------
015450  012737  000036  001226           TST36:  MOV     #36,TSTNO
015456  012737  015650  001216                   MOV     #TST37,NEXT
015464  005737  007260                           TST     TURFLG                          ;TURN AROUND H861 OR H325?
015470  001005                                   BNE     1$                              ;BR IF H325
015472  013737  001216  001214                   MOV     NEXT,RETURN
015500  000177  163510                           JMP     @RETURN
015504  005077  171570                   1$:     CLR     @MC.CSR                         ;CLEAR CONTROL STATUS REGISTER
015510  005037  177776                           CLR     PS                              ;ZERO PSW.
015514  013701  007262                           MOV     LINE,R1                         ;SET LINE IMAGE
015520  012777  002000  171552           2$:     MOV     #CLRMUX,@MC.CSR                 ;CLEAR MUX
015526  012702  000020                           MOV     #16.,R2                         ;SET FOR 16 LINES
015532  010177  171542                           MOV     R1,@MC.CSR                      ;SELECT LINE TO BE TESTED
015536  012777  000010  171536                   MOV     #NS,@MC.LSR                     ;SET NEW SYNC (SECTX IF ASYNC LC) FUNCTION FLIP-
015544  005077  171530                           CLR     @MC.CSR                         ;ZERO CSR
015550  005005                           3$:     CLR     R5                              ;SET EXPECTED
015552  017704  171524                           MOV     @MC.LSR,R4                      ;READ LINE STATUS REGISTER
015556  117703  171516                           MOVB    @MC.CSR,R3                      ;READ CONTROL STATUS REGISTER
015562  042703  177760                           BIC     #^C<17>,R3                      ;CLEAR UNWANTED BITS
015566  020103                                   CMP     R1,R3                           ;IF LINE NUMBER=SELECTED LINE NUMBER,
015570  001002                                   BNE     4$                              ;EXCEPT NEW SYNC (SECTX IF ASYNC LC) FUNCTION FL
015572  012705  000010                           MOV     #NS,R5                  ;SET "GOOD"
                                                                                         ;TO BE SET
015576  020504                           4$:     CMP     R5,R4                           ;COMPARE EXPECTED AND RECEIVED
015600  001401                                   BEQ     5$                              ;RESULTS
015602  104001                                   HLT     1                               ;R5=EXPECTED R4=FOUND
015604  052777  000400  171466           5$:     BIS     #STEP,@MC.CSR                   ;EXAMINE NEXT LINE
015612  005302                                   DEC     R2                              ;ALL LINES DONE?
015614  001355                                   BNE     3$                              ;BR IF NO
015616  005005                                   CLR     R5                              ;CLEAR "GOOD"
015620  010177  171454                   6$:     MOV     R1,@MC.CSR                      ;LOAD LINE
015624  010103                                   MOV     R1,R3                           ;SET LINE COUNTER TO SELECTED LINE
015626  005077  171450                           CLR     @MC.LSR                         ;CLEAR NEW SYNC (SECTX IF ASYNC LC) FLIP FLOP
015632  104414                                   DELAY                                   ;DELAY FOR CABLE
015634  017704  171442                           MOV     @MC.LSR,R4                      ;READ LINE STATUS REGISTER
015640  005704                                   TST     R4                              ;WAS NEW SYNC (SECTX IF ASYNC LC) FUNCTION FLIP
015642  001401                                   BEQ     .+4                             ;CLEARED
015644  104001                                   HLT     1                               ;R5=EXPECTED R4=FOUND
015646  104400                           7$:     SCOPE                                   ;CHECK FOR ITERATIONS, LOOP
```

```

                                                  ;************************** TEST 37 *******************************
                                                  ;*VERIFY THAT RING IS SET IF 'LINE ENABLE''
                                                  ;*AND TERMINAL ARE SET FOR SELECTED LINE.
                                                  ;*THIS TEST IS DONE IF THE H325 TURN AROUND IS USED
                                                  ; MODEM CONTROL LINES *MUST* BE CONTIGUOUS FROM LINE 00.
                                                  ;;***************************************************************


                                     ;  TEST 37
                                     ;---------------
015650  012737  000037  001226       TST37:  MOV     #37,TSTNO
015656  012737  016046  001216               MOV     #TST40,NEXT
015664  005737  007260                       TST     TURFLG                       ;TURN AROUND H861 OR H325?
015670  001005                               BNE     1$                           ;BR IF H325
015672  013737  001216  001214               MOV     NEXT,RETURN
015700  000177  163310                       JMP     @RETURN
015704  005077  171370               1$:     CLR     @MC.CSR                      ;CLEAR CONTROL REGISTER
015710  005037  177776                       CLR     PS                           ;ZERO PSW
015714  013701  007262                       MOV     LINE,R1                      ;LINE NUMBER
015720  012702  000020               2$:     MOV     #16.,R2                      ;16 LINES
015724  010177  171350                       MOV     R1,@MC.CSR                   ;SELECT A LINE
015730  012777  000003  171344               MOV     #LINENA+TRMRDY,@MC.LSR       ;SET LINE ENABLE +TRMRDY
015736  005077  171336                       CLR     @MC.CSR                      ;CLEAR CONTROL REGISTER
015742  005005                       3$:     CLR     R5                           ;CLEAR EXPECTED RESULT
015744  017704  171332                       MOV     @MC.LSR,R4                   ;READ LINE STATUS
015750  117703  171324                       MOVB    @MC.CSR,R3                   ;READ LINE NUMBER
015754  042703  177760                       BIC     #^C<17>,R3                   ;CLEAR UNWANTED BITS
015760  020103                               CMP     R1,R3                        ;IF RECEIVED LINE=SELECTED LINE
015762  001002                               BNE     4$                           ;EXPECT LINE ENABLE AND
015764  012705  000203                       MOV     #LINENA+TRMRDY+RING,R5
                                                                                  ;RING IS SET
015770  020405                       4$:     CMP     R4,R5                        ;COMPARE EXPECTED AND
015772  001401                               BEQ     5$                           ;RECEIVED RESULTS
015774  104001                               HLT     1                            ;R5=EXPECTED R4=FOUND
015776  052777  000400  171274       5$:     BIS     #STEP,@MC.CSR                ;UPDATE LINE COUNTER
016004  005302                               DEC     R2                           ;CONTINUE IF ALL CHECKS
016006  001355                               BNE     3$                           ;ARE NOT DONE FOR THIS LINE
016010  012705  000001                       MOV     #LINENA,R5                   ;EXPECT LINE ENABLE
016014  010103                       6$:     MOV     R1,R3                        ;ON SELECTED LINE
016016  010177  171256                       MOV     R1,@MC.CSR                   ;SELECT LINE
016022  042777  000002  171252               BIC     #TRMRDY,@MC.LSR              ;CLEAR TERMINAL
016030  104414                               DELAY                                ;DELAY FOR CABLE
016032  017704  171244                       MOV     @MC.LSR,R4                   ;READ LINE STATUS REGISTER
016036  020504                               CMP     R5,R4                        ;ONLY LINE ENABLE SHOULD BE
016040  001401                               BEQ     .+4                          ;SET ON THIS LINE
016042  104001                               HLT     1                            ;R5=EXPECTED R4=FOUND
016044  104400                       7$:     SCOPE                                ;CHECK FOR ITERATIONS, LOOP
```

```

                                                          ;*************************** TEST 40 ********************************
                                                          ;*VERIFY THAT CLEAR TO SEND AND CARRIER ARE SET IF ''LINE ENABLE''
                                                          ;*AND REQUEST TO SEND ARE SET FOR SELECTED LINE.
                                                          ;*THIS TEST IS DONE IF THE H325 TURN AROUND IS USED
                                                          ; MODEM CONTROL LINES *MUST* BE CONTIGUOUS FROM LINE 00.
                                                          ;;*****************************************************************

                                         ;  TEST 40
                                         ;--------------
016046  012737  000040  001226  TST40:  MOV     #40,TSTNO
016054  012737  016244  001216          MOV     #TST41,NEXT
016062  005737  007260                  TST     TURFLG                  ;TURN AROUND H861 OR H325?
016066  001005                          BNE     1$                      ;BR IF H325
016070  013737  001216  001214          MOV     NEXT,RETURN
016076  000177  163112                  JMP     @RETURN
016102  005077  171172          1$:     CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
016106  005037  177776                  CLR     PS                      ;ZERO PSW
016112  013701  007262                  MOV     LINE,R1                 ;LINE NUMBER
016116  012702  000020          2$:     MOV     #16.,R2                 ;16 LINES
016122  010177  171152                  MOV     R1,@MC.CSR              ;SELECT A LINE
016126  012777  000005  171146          MOV     #LINENA+RS,@MC.LSR      ;SET LINE ENABLE +RS
016134  005077  171140                  CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
016140  005005                  3$:     CLR     R5                      ;CLEAR EXPECTED RESULT
016142  017704  171134                  MOV     @MC.LSR,R4              ;READ LINE STATUS
016146  117703  171126                  MOVB    @MC.CSR,R3              ;READ LINE NUMBER
016152  042703  177760                  BIC     #^C<17>,R3              ;CLEAR UNWANTED BITS
016156  020103                          CMP     R1,R3                   ;IF RECEIVED LINE=SELECTED LINE
016160  001002                          BNE     4$                      ;EXPECT LINE ENABLE AND
016162  012705  000145                  MOV     #LINENA+RS+CO+CS,R5
                                                                        ;CLEAR TO SEND AND CARRIER ARE SET
016166  020405                  4$:     CMP     R4,R5                   ;COMPARE EXPECTED AND
016170  001401                          BEQ     5$                      ;RECEIVED RESULTS
016172  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
016174  052777  000400  171076  5$:     BIS     #STEP,@MC.CSR           ;UPDATE LINE COUNTER
016202  005302                          DEC     R2                      ;CONTINUE IF ALL CHECKS
016204  001355                          BNE     3$                      ;ARE NOT DONE FOR THIS LINE
016206  012705  000001                  MOV     #LINENA,R5              ;EXPECT LINE ENABLE
016212  010103                  6$:     MOV     R1,R3                   ;ON SELECTED LINE
016214  010177  171060                  MOV     R1,@MC.CSR              ;SELECT LINE
016220  042777  000004  171054          BIC     #RS,@MC.LSR             ;CLEAR REQUEST TO SEND
016226  104414                          DELAY                           ;DELAY FOR CABLE
016230  017704  171046                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
016234  020504                          CMP     R5,R4                   ;ONLY LINE ENABLE SHOULD BE
016236  001401                          BEQ     .+4                     ;SET ON THIS LINE
016240  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
016242  104400                  7$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```

                                                 ;************************** TEST 41 **********************************
                                                 ;*VERIFY THAT DATA SET READY(SECRX IF ASYNC LC) IS SET IF ''LINE ENABLE''
                                                 ;*AND NEW SYNC (SECTX IF ASYNC LC) ARE SET FOR SELECTED LINE.
                                                 ;*THIS TEST IS DONE IF THE H325 TURN AROUND IS USED
                                                 ; MODEM CONTROL LINES *MUST* BE CONTIGUOUS FROM LINE 00.
                                                 ;:*******************************************************************

                                ;  TEST 41
                                ;--------------
016244  012737  000041  001226  TST41:  MOV     #41,TSTNO
016252  012737  016442  001216          MOV     #TST42,NEXT
016260  005737  007260                  TST     TURFLG                          ;TURN AROUND H861 OR H325?
016264  001005                          BNE     1$                              ;BR IF H325
016266  013737  001216  001214          MOV     NEXT,RETURN
016274  000177  162714                  JMP     @RETURN
016300  005077  170774          1$:     CLR     @MC.CSR                         ;CLEAR CONTROL REGISTER
016304  005037  177776                  CLR     PS                              ;ZERO PSW
016310  013701  007262                  MOV     LINE,R1                         ;LINE NUMBER
016314  012702  000020          2$:     MOV     #16.,R2                         ;16 LINES
016320  010177  170754                  MOV     R1,@MC.CSR                      ;SELECT A LINE
016324  012777  000011  170750          MOV     #LINENA+NS,@MC.LSR              ;SET LINE ENABLE +NS
016332  005077  170742                  CLR     @MC.CSR                         ;CLEAR CONTROL RFGISTER
016336  005005                  3$:     CLR     R5                              ;CLEAR EXPECTED RESULT
016340  017704  170736                  MOV     @MC.LSR,R4                      ;READ LINE STATUS
016344  117703  170730                  MOVB    @MC.CSR,R3                      ;READ LINE NUMBER
016350  042703  177760                  BIC     #^C<17>,R3                      ;CLEAR UNWANTED BITS
016354  020103                          CMP     R1,R3                           ;IF RECEIVED LINE=SELECTED LINE
016356  001002                          BNE     4$                              ;EXPECT LINE ENABLE AND
016360  012705  000031                  MOV     #LINENA+NS+DSR,R5
                                                                                ;DATA SET READY(SECRX IF ASYNC LC) IS SET
016364  020405                  4$:     CMP     R4,R5                           ;COMPARE EXPECTED AND
016366  001401                          BEQ     5$                              ;RECEIVED RESULTS
016370  104001                          HLT     1                               ;R5=EXPECTED R4=FOUND
016372  052777  000400  170700  5$:     BIS     #STEP,@MC.CSR                   ;UPDATE LINE COUNTER
016400  005302                          DEC     R2                              ;CONTINUE IF ALL CHECKS
016402  001355                          BNE     3$                              ;ARE NOT DONE FOR THIS LINE
016404  012705  000001                  MOV     #LINENA,R5                      ;EXPECT LINE ENABLE
016410  010103                  6$:     MOV     R1,R3                           ;ON SELECTED LINE
016412  010177  170662                  MOV     R1,@MC.CSR                      ;SELECT LINE
016416  042777  000010  170656          BIC     #NS,@MC.LSR                     ;CLEAR NEW SYNC (SECTX IF ASYNC LC)
016424  104414                          DELAY                                   ;DELAY FOR CABLE
016426  017704  170650                  MOV     @MC.LSR,R4                      ;READ LINE STATUS REGISTER
016432  020504                          CMP     R5,R4                           ;ONLY LINE ENABLE SHOULD BE
016434  001401                          BEQ     .+4                             ;SET ON THIS LINE
016436  104001                          HLT     1                               ;R5=EXPECTED R4=FOUND
016440  104400                  7$:     SCOPE                                   ;CHECK FOR ITERATIONS, LOOP
```

```
                                            ;************************ TEST 42 ******************************
                                            ;*VERIFY THAT LINE ENABLE FUNCTION FLIP-FLOP CAN
                                            ;*BE SET AND CLEARED FOR SELECTED LINE
                                            ;*THIS TEST IS DONE IF THE H861 TURN AROUND IS USED.
                                            ; MODEM CONTROL LINES *MUST* BE CONTIGUOUS FROM LINE 00.
                                            ;:***************************************************************

                                  ;  TEST 42
                                  ;--------------
016442  012737  000042  001226  TST42:  MOV     #42,TSTNO
016450  012737  016666  001216          MOV     #TST43,NEXT
016456  005737  007260                  TST     TURFLG                  ;TURN AROUND H861 OR H325?
016462  001405                          BEQ     1$                      ;BR IF H861
016464  013737  001216  001214          MOV     NEXT,RETURN
016472  000177  162516                  JMP     @RETURN
016476  005077  170576          1$:     CLR     @MC.CSR                 ;CLEAR CONTROL STATUS REGISTER
016502  005037  177776                  CLR     PS                      ;ZERO PSW.
016506  013700  007276                  MOV     TOTAL,R0                ;SET THE TOTAL NUMBER OF LINES TO BE TESTED IN R
016512  005001                          CLR     R1
016514  012737  016522  001220          MOV     #2$,LOCK
016522  012777  002000  170550  2$:     MOV     #CLRMUX,@MC.CSR         ;CLEAR MUX
016530  012702  000020                  MOV     #16.,R2                 ;SET FOR 16 LINES
016534  010177  170540                  MOV     R1,@MC.CSR              ;SELECT LINE TO BE TESTED
016540  010137  007262                  MOV     R1,LINE                 ;SET IMAGE
016544  012777  000001  170530          MOV     #LINENA,@MC.LSR         ;SET LINE ENABLE FUNCTION FLIP-FLOP
016552  005077  170522                  CLR     @MC.CSR                 ;ZERO CSR
016556  005005                  3$:     CLR     R5                      ;SET EXPECTED
016560  017704  170516                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
016564  117703  170510                  MOVB    @MC.CSR,R3              ;READ CONTROL STATUS REGISTER
016570  042703  177760                  BIC     #^C<17>,R3              ;CLEAR UNWANTED BITS
016574  020103                          CMP     R1,R3                   ;IF LINE NUMBER=SELECTED LINE NUMBER,
016576  001002                          BNE     4$                      ;EXCEPT LINE ENABLE FUNCTION FLIP FLOP
016600  012705  000001                  MOV     #LINENA,R5              ;SET ''GOOD''
                                                                        ;TO BE SET
016604  020504                  4$:     CMP     R5,R4                   ;COMPARE EXPECTED AND RECEIVED
016606  001401                          BEQ     5$                      ;RESULTS
016610  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
016612  052777  000400  170460  5$:     BIS     #STEP,@MC.CSR           ;EXAMINE NEXT LINE
016620  005302                          DEC     R2                      ;ALL LINES DONE?
016622  001355                          BNE     3$                      ;BR IF NO
016624  005005                          CLR     R5                      ;CLEAR ''GOOD''
016626  010177  170446          6$:     MOV     R1,@MC.CSR              ;LOAD LINE
016632  010103                          MOV     R1,R3                   ;SET LINE COUNTER TO SELECTED LINE
016634  005077  170442                  CLR     @MC.LSR                 ;CLEAR LINE ENABLE FLIP FLOP
016640  104414                          DELAY                           ;DELAY FOR CABLE
016642  017704  170434                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
016646  005704                          TST     R4                      ;WAS LINE ENABLE FUNCTION FLIP FLOP
016650  001401                          BEQ     .+4                     ;CLEARED
016652  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
016654  104401                          SCOP1
016656  005201                          INC     R1
016660  005300                          DEC     R0
016662  001317                          BNE     2$
016664  104400                  7$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```
                                                ;************************** TEST 43 *******************************
                                                ;*VERIFY THAT TERMINAL READY FUNCTION FLIP-FLOP CAN
                                                ;*BE SET AND CLEARED FOR SELECTED LINE
                                                ;*THIS TEST IS DONE IF THE H861 TURN AROUND IS USED.
                                                ; MODEM CONTROL LINES *MUST* BE CONTIGUOUS FROM LINE 00.
                                                ;;*****************************************************************


                                        ;  TEST 43
                                        ;--------------
016666  012737  000043  001226  TST43:  MOV     #43,TSTNO
016674  012737  017112  001216          MOV     #TST44,NEXT
016702  005737  007260                  TST     TURFLG                  ;TURN AROUND H861 OR H325?
016706  001405                          BEQ     1$                      ;BR IF H861
016710  013737  001216  001214          MOV     NEXT,RETURN
016716  000177  162272                  JMP     @RETURN
016722  005077  170352          1$:     CLR     @MC.CSR                 ;CLEAR CONTROL STATUS REGISTER
016726  005037  177776                  CLR     PS                      ;ZERO PSW.
016732  013700  007276                  MOV     TOTAL,R0                ;SET THE TOTAL NUMBER OF LINES TO BE TESTED IN R
016736  005001                          CLR     R1
016740  012737  016746  001220          MOV     #2$,LOCK
016746  012777  002000  170324  2$:     MOV     #CLRMUX,@MC.CSR         ;CLEAR MUX
016754  012702  000020                  MOV     #16.,R2                 ;SET FOR 16 LINES
016760  010177  170314                  MOV     R1,@MC.CSR              ;SELECT LINE TO BE TESTED
016764  010137  007262                  MOV     R1,LINE                 ;SET IMAGE
016770  012777  000002  170304          MOV     #TRMRDY,@MC.LSR         ;SET TERMINAL READY FUNCTION FLIP-FLOP
016776  005077  170276                  CLR     @MC.CSR                 ;ZERO CSR
017002  005005                  3$:     CLR     R5                      ;SET EXPECTED
017004  017704  170272                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
017010  117703  170264                  MOVB    @MC.CSR,R3              ;READ CONTROL STATUS REGISTER
017014  042703  177760                  BIC     #^C<17>,R3              ;CLEAR UNWANTED BITS
017020  020103                          CMP     R1,R3                   ;IF LINE NUMBER=SELECTED LINE NUMBER,
017022  001002                          BNE     4$                      ;EXCEPT TERMINAL READY FUNCTION FLIP FLOP
017024  012705  000002                  MOV     #TRMRDY,R5              ;SET ''GOOD''
                                                                        ;TO BE SET
017030  020504                  4$:     CMP     R5,R4                   ;COMPARE EXPECTED AND RECEIVED
017032  001401                          BEQ     5$                      ;RESULTS
017034  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
017036  052777  000400  170234  5$:     BIS     #STEP,@MC.CSR           ;EXAMINE NEXT LINE
017044  005302                          DEC     R2                      ;ALL LINES DONE?
017046  001355                          BNE     3$                      ;BR IF NO
017050  005005                          CLR     R5                      ;CLEAR ''GOOD''
017052  010177  170222          6$:     MOV     R1,@MC.CSR              ;LOAD LINE
017056  010103                          MOV     R1,R3                   ;SET LINE COUNTER TO SELECTED LINE
017060  005077  170216                  CLR     @MC.LSR                 ;CLEAR TERMINAL READY FLIP FLOP
017064  104414                          DELAY                           ;DELAY FOR CABLE
017066  017704  170210                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
017072  005704                          TST     R4                      ;WAS TERMINAL READY FUNCTION FLIP FLOP
017074  001401                          BEQ     .+4                     ;CLEARED
017076  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
017100  104401                          SCOP1
017102  005201                          INC     R1
017104  005300                          DEC     R0
017106  001317                          BNE     2$
017110  104400                  7$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```
                                                ;************************** TEST 44 ********************************
                                                ;*VERIFY THAT REQUEST TO SEND FUNCTION FLIP-FLOP CAN
                                                ;*BE SET AND CLEARED FOR SELECTED LINE
                                                ;*THIS TEST IS DONE IF THE H861 TURN AROUND IS USED.
                                                ; MODEM CONTROL LINES *MUST* BE CONTIGUOUS FROM LINE 00.
                                                ;*******************************************************************

                                ;  TEST 44
                                ;---------------
017112  012737  000044  001226  TST44:  MOV     #44,TSTNO
017120  012737  017336  001216          MOV     #TST45,NEXT
017126  005737  007260                  TST     TURFLG                ;TURN AROUND H861 OR H325?
017132  001405                          BEQ     1$                    ;BR IF H861
017134  013737  001216  001214          MOV     NEXT,RETURN
017142  000177  162046                  JMP     @RETURN
017146  005077  170126          1$:     CLR     @MC.CSR               ;CLEAR CONTROL STATUS REGISTER
017152  005037  177776                  CLR     PS                    ;ZERO PSW.
017156  013700  007276                  MOV     TOTAL,R0              ;SET THE TOTAL NUMBER OF LINES TO BE TESTED IN R
017162  005001                          CLR     R1
017164  012737  017172  001220          MOV     #2$,LOCK
017172  012777  002000  170100  2$:     MOV     #CLRMUX,@MC.CSR       ;CLEAR MUX
017200  012702  000020                  MOV     #16.,R2               ;SET FOR 16 LINES
017204  010177  170070                  MOV     R1,@MC.CSR            ;SELECT LINE TO BE TESTED
017210  010137  007262                  MOV     R1,LINE               ;SET IMAGE
017214  012777  000004  170060          MOV     #RS,@MC.LSR           ;SET REQUEST TO SEND FUNCTION FLIP-FLOP
017222  005077  170052                  CLR     @MC.CSR               ;ZERO CSR
017226  005005                  3$:     CLR     R5                    ;SET EXPECTED
017230  017704  170046                  MOV     @MC.LSR,R4            ;READ LINE STATUS REGISTER
017234  117703  170040                  MOVB    @MC.CSR,R3            ;READ CONTROL STATUS REGISTER
017240  042703  177760                  BIC     #^C<17>,R3            ;CLEAR UNWANTED BITS
017244  020103                          CMP     R1,R3                 ;IF LINE NUMBER=SELECTED LINE NUMBER,
017246  001002                          BNE     4$                    ;EXCEPT REQUEST TO SEND FUNCTION FLIP FLOP
017250  012705  000004                  MOV     #RS,R5          ;SET ''GOOD''
                                                                      ;TO BE SET
017254  020504                  4$:     CMP     R5,R4                 ;COMPARE EXPECTED AND RECEIVED
017256  001401                          BEQ     5$                    ;RESULTS
017260  104001                          HLT     1                     ;R5=EXPECTED R4=FOUND
017262  052777  000400  170010  5$:     BIS     #STEP,@MC.CSR         ;EXAMINE NEXT LINE
017270  005302                          DEC     R2                    ;ALL LINES DONE?
017272  001355                          BNE     3$                    ;BR IF NO
017274  005005                          CLR     R5                    ;CLEAR ''GOOD''
017276  010177  167776          6$:     MOV     R1,@MC.CSR            ;LOAD LINE
017302  010103                          MOV     R1,R3                 ;SET LINE COUNTER TO SELECTED LINE
017304  005077  167772                  CLR     @MC.LSR               ;CLEAR REQUEST TO SEND FLIP FLOP
017310  104414                          DELAY                         ;DELAY FOR CABLE
017312  017704  167764                  MOV     @MC.LSR,R4            ;READ LINE STATUS REGISTER
017316  005704                          TST     R4                    ;WAS REQUEST TO SEND FUNCTION FLIP FLOP
017320  001401                          BEQ     .+4                   ;CLEARED
017322  104001                          HLT     1                     ;R5=EXPECTED R4=FOUND
017324  104401                          SCOP1
017326  005201                          INC     R1
017330  005300                          DEC     R0
017332  001317                          BNE     2$
017334  104400                  7$:     SCOPE                         ;CHECK FOR ITERATIONS, LOOP
```

```
                                                 ;************************** TEST 45 *********************************
                                                 ;*VERIFY THAT SECONDARY TRANSMIT FUNCTION FLIP-FLOP CAN
                                                 ;*BE SET AND CLEARED FOR SELECTED LINE
                                                 ;*THIS TEST IS DONE IF THE H861 TURN AROUND IS USED.
                                                 ; MODEM CONTROL LINES *MUST* BE CONTIGUOUS FROM LINE 00.
                                                 ;:********************************************************************

                                         ;  TEST 45
                                         ;---------------
017336  012737  000045  001226   TST45:  MOV     #45,TSTNO
017344  012737  017562  001216           MOV     #TST46,NEXT
017352  005737  007260                   TST     TURFLG                  ;TURN AROUND H861 OR H325?
017356  001405                           BEQ     1$                      ;BR IF H861
017360  013737  001216  001214           MOV     NEXT,RETURN
017366  000177  161622                   JMP     @RETURN
017372  005077  167702           1$:     CLR     @MC.CSR                 ;CLEAR CONTROL STATUS REGISTER
017376  005037  177776                   CLR     PS                      ;ZERO PSW.
017402  013700  007276                   MOV     TOTAL,R0                ;SET THE TOTAL NUMBER OF LINES TO BE TESTED IN R
017406  005001                           CLR     R1
017410  012737  017416  001220           MOV     #2$,LOCK
017416  012777  002000  167654   2$:     MOV     #CLRMUX,@MC.CSR         ;CLEAR MUX
017424  012702  000020                   MOV     #16.,R2                 ;SET FOR 16 LINES
017430  010177  167644                   MOV     R1,@MC.CSR              ;SELECT LINE TO BE TESTED
017434  010137  007262                   MOV     R1,LINE                 ;SET IMAGE
017440  012777  000010  167634           MOV     #SECTX,@MC.LSR          ;SET SECONDARY TRANSMIT FUNCTION FLIP-FLOP
017446  005077  167626                   CLR     @MC.CSR                 ;ZERO CSR
017452  005005                   3$:     CLR     R5                      ;SET EXPECTED
017454  017704  167622                   MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
017460  117703  167614                   MOVB    @MC.CSR,R3              ;READ CONTROL STATUS REGISTER
017464  042703  177760                   BIC     #^C<17>,R3              ;CLEAR UNWANTED BITS
017470  020103                           CMP     R1,R3                   ;IF LINE NUMBER=SELECTED LINE NUMBER,
017472  001002                           BNE     4$                      ;EXCEPT SECONDARY TRANSMIT FUNCTION FLIP FLOP
017474  012705  000010                   MOV     #SECTX,R5               ;SET ''GOOD''
                                                                         ;TO BE SET
017500  020504                   4$:     CMP     R5,R4                   ;COMPARE EXPECTED AND RECEIVED
017502  001401                           BEQ     5$                      ;RESULTS
017504  104001                           HLT     1                       ;R5=EXPECTED R4=FOUND
017506  052777  000400  167564   5$:     BIS     #STEP,@MC.CSR           ;EXAMINE NEXT LINE
017514  005302                           DEC     R2                      ;ALL LINES DONE?
017516  001355                           BNE     3$                      ;BR IF NO
017520  005005                           CLR     R5                      ;CLEAR ''GOOD''
017522  010177  167552           6$:     MOV     R1,@MC.CSR              ;LOAD LINE
017526  010103                           MOV     R1,R3                   ;SET LINE COUNTER TO SELECTED LINE
017530  005077  167546                   CLR     @MC.LSR                 ;CLEAR SECONDARY TRANSMIT FLIP FLOP
017534  104414                           DELAY                           ;DELAY FOR CABLE
017536  017704  167540                   MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
017542  005704                           TST     R4                      ;WAS SECONDARY TRANSMIT FUNCTION FLIP FLOP
017544  001401                           BEQ     .+4                     ;CLEARED
017546  104001                           HLT     1                       ;R5=EXPECTED R4=FOUND
017550  104401                           SCOP1
017552  005201                           INC     R1
017554  005300                           DEC     R0
017556  001317                           BNE     2$
017560  104400                   7$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```

                                                    ;************************* TEST 46 ********************************
                                                    ;*VERIFY THAT CLEAR TO SEND AND CARRIER ARE SET IF ''LINE ENABLE''
                                                    ;*AND TERMINAL ARE SET FOR SELECTED LINE.
                                                    ;*THIS TEST IS DONE IF THE H861 TURN AROUND IS USED.
                                                    ; MODEM CONTROL LINES *MUST* BE CONTIGUOUS FROM LINE 00.
                                                    ;:*****************************************************************

                                ;  TEST 46
                                ;---------------
017562  012737  000046  001226  TST46:  MOV     #46,TSTNO
017570  012737  020004  001216          MOV     #TST47,NEXT
017576  005737  007260                  TST     TURFLG                          ;TURN AROUND H861 OR H325?
017602  001405                          BEQ     1$                              ;BR IF H861
017604  013737  001216  001214          MOV     NEXT,RETURN
017612  000177  161376                  JMP     @RETURN
017616  005077  167456          1$:     CLR     @MC.CSR                         ;CLEAR CONTROL REGISTER
017622  005037  177776                  CLR     PS                              ;ZERO PSW
017626  013700  007276                  MOV     TOTAL,R0                        ;SET THE TOTAL NUMBER OF LINES TO BE TESTED IN R
017632  005001                          CLR     R1
017634  012737  017642  001220          MOV     #2$,LOCK
017642  012702  000020          2$:     MOV     #16.,R2                         ;16 LINES
017646  010177  167426                  MOV     R1,@MC.CSR                      ;SELECT A LINE
017652  012777  000003  167422          MOV     #LINENA+TRMRDY,@MC.LSR          ;SET LINE ENABLE +TRMRDY
017660  005077  167414                  CLR     @MC.CSR                         ;CLEAR CONTROL REGISTER
017664  005005                  3$:     CLR     R5                              ;CLEAR EXPECTED RESULT
017666  017704  167410                  MOV     @MC.LSR,R4                      ;READ LINE STATUS
017672  117703  167402                  MOVB    @MC.CSR,R3                      ;READ LINE NUMBER
017676  042703  177760                  BIC     #^C<17>,R3                      ;CLEAR UNWANTED BITS
017702  020103                          CMP     R1,R3                           ;IF RECEIVED LINE=SELECTED LINE
017704  001002                          BNE     4$                              ;EXPECT LINE ENABLE AND
017706  012705  000143                  MOV     #LINENA+TRMRDY+CO+CS,R5
                                                                                ;CLEAR TO SEND AND CARRIER ARE SET
017712  020405                  4$:     CMP     R4,R5                           ;COMPARE EXPECTED AND
017714  001401                          BEQ     5$                              ;RECEIVED RESULTS
017716  104001                          HLT     1                               ;R5=EXPECTED R4=FOUND
017720  052777  000400  167352  5$:     BIS     #STEP,@MC.CSR                   ;UPDATE LINE COUNTER
017726  005302                          DEC     R2                              ;CONTINUE IF ALL CHECKS
017730  001355                          BNE     3$                              ;ARE NOT DONE FOR THIS LINE
017732  012705  000001                  MOV     #LINENA,R5                      ;EXPECT LINE ENABLE
017736  010103                  6$:     MOV     R1,R3                           ;ON SELECTED LINE
017740  010177  167334                  MOV     R1,@MC.CSR                      ;SELECT LINE
017744  042777  000002  167330          BIC     #TRMRDY,@MC.LSR                 ;CLEAR TERMINAL
017752  104414                          DELAY                                   ;DELAY FOR CABLE
017754  017704  167322                  MOV     @MC.LSR,R4                      ;READ LINE STATUS REGISTER
017760  020504                          CMP     R5,R4                           ;ONLY LINE ENABLE SHOULD BE
017762  001401                          BEQ     .+4                             ;SET ON THIS LINE
017764  104001                          HLT     1                               ;R5=EXPECTED R4=FOUND
017766  104401                          SCOP1
017770  005201                          INC     R1
017772  005077  167304                  CLR     @MC.LSR
017776  005300                          DEC     R0
020000  001320                          BNE     2$
020002  104400                  7$:     SCOPE                                   ;CHECK FOR ITERATIONS, LOOP
```

```


                                                     ;*************************** TEST 47 ********************************
                                                     ;*VERIFY THAT RING IS SET IF ''LINE ENABLE''
                                                     ;*AND REQUEST TO SEND ARE SET FOR SELECTED LINE.
                                                     ;*THIS TEST IS DONE IF THE H861 TURN AROUND IS USED.
                                                     ; MODEM CONTROL LINES *MUST* BE CONTIGUOUS FROM LINE 00.
                                                     ;:*****************************************************************

                                      ;  TEST 47
                                      ;---------------
020004  012737  000047  001226  TST47:  MOV     #47,TSTNO
020012  012737  020226  001216          MOV     #TST50,NEXT
020020  005737  007260                  TST     TURFLG                  ;TURN AROUND H861 OR H325?
020024  001405                          BEQ     1$                      ;BR IF H861
020026  013737  001216  001214          MOV     NEXT,RETURN
020034  000177  161154                  JMP     @RETURN
020040  005077  167234          1$:     CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
020044  005037  177776                  CLR     PS                      ;ZERO PSW
020050  013700  007276                  MOV     TOTAL,R0                ;SET THE TOTAL NUMBER OF LINES TO BE TESTED IN R
020054  005001                          CLR     R1
020056  012737  020064  001220          MOV     #2$,LOCK
020064  012702  000020          2$:     MOV     #16.,R2                 ;16 LINES
020070  010177  167204                  MOV     R1,@MC.CSR              ;SELECT A LINE
020074  012777  000005  167200          MOV     #LINENA+RS,@MC.LSR      ;SET LINE ENABLE +RS
020102  005077  167172                  CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
020106  005005                  3$:     CLR     R5                      ;CLEAR EXPECTED RESULT
020110  017704  167166                  MOV     @MC.LSR,R4              ;READ LINE STATUS
020114  117703  167160                  MOVB    @MC.CSR,R3              ;READ LINE NUMBER
020120  042703  177760                  BIC     #^C<17>,R3              ;CLEAR UNWANTED BITS
020124  020103                          CMP     R1,R3                   ;IF RECEIVED LINE=SELECTED LINE
020126  001002                          BNE     4$                      ;EXPECT LINE ENABLE AND
020130  012705  000205                  MOV     #LINENA+RS+RING,R5
                                                                        ;RING IS SET
020134  020405                  4$:     CMP     R4,R5                   ;COMPARE EXPECTED AND
020136  001401                          BEQ     5$                      ;RECEIVED RESULTS
020140  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
020142  052777  000400  167130  5$:     BIS     #STEP,@MC.CSR           ;UPDATE LINE COUNTER
020150  005302                          DEC     R2                      ;CONTINUE IF ALL CHECKS
020152  001355                          BNE     [illegible]             ;ARE NOT DONE FOR THIS LINE
020154  012705  000001                  MOV     #LINENA,R5              ;EXPECT LINE ENABLE
020160  010103                  6$:     MOV     R1,R3                   ;ON SELECTED LINE
020162  010177  167112                  MOV     R1,@MC.CSR              ;SELECT LINE
020166  042777  000004  167106          BIC     #RS,@MC.LSR             ;CLEAR REQUEST TO SEND
020174  104414                          DELAY                           ;DELAY FOR CABLE
020176  017704  167100                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
020202  020504                          CMP     R5,R4                   ;ONLY LINE ENABLE SHOULD BE
020204  001401                          BEQ     .+4                     ;SET ON THIS LINE
020206  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
020210  104401                          SCOP1
020212  005201                          INC     R1
020214  005077  167062                  CLR     @MC.LSR
020220  005300                          DEC     R0
020222  001320                          BNE     2$
020224  104400                  7$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```
                                                 ;************************ TEST 50 ******************************
                                                 ;*VERIFY THAT SECONDARY RECEIVE IS SET IF ''LINE ENABLE''
                                                 ;*AND SECONDARY TRANSMIT ARE SET FOR SELECTED LINE.
                                                 ;*THIS TEST IS DONE IF THE H861 TURN AROUND IS USED.
                                                 ; MODEM CONTROL LINES *MUST* BE CONTIGUOUS FROM LINE 00.
                                                 ;:*************************************************************

                                   ;  TEST 50
                                   ;--------------
020226  012737  000050  001226     TST50:  MOV     #50,TSTNO
020234  012737  020450  001216             MOV     #TST51,NEXT
020242  005737  007260                     TST     TURFLG                        ;TURN AROUND H861 OR H325?
020246  001405                             BEQ     1$                            ;BR IF H861
020250  013737  001216  001214             MOV     NEXT,RETURN
020256  000177  160732                     JMP     @RETURN
020262  005077  167012             1$:     CLR     @MC.CSR                       ;CLEAR CONTROL REGISTER
020266  005037  177776                     CLR     PS                            ;ZERO PSW
020272  013700  007276                     MOV     TOTAL,R0                      ;SET THE TOTAL NUMBER OF LINES TO BE TESTED IN R
020276  005001                             CLR     R1
020300  012737  020306  001220             MOV     #2$,LOCK
020306  012702  000020             2$:     MOV     #16.,R2                       ;16 LINES
020312  010177  166762                     MOV     R1,@MC.CSR                    ;SELECT A LINE
020316  012777  000011  166756             MOV     #LINENA+SECTX,@MC.LSR         ;SET LINE ENABLE +SECTX
020324  005077  166750                     CLR     @MC.CSR                       ;CLEAR CONTROL REGISTER
020330  005005                     3$:     CLR     R5                            ;CLEAR EXPECTED RESULT
020332  017704  166744                     MOV     @MC.LSR,R4                    ;READ LINE STATUS
020336  117703  166736                     MOVB    @MC.CSR,R3                    ;READ LINE NUMBER
020342  042703  177760                     BIC     #^C<17>,R3                    ;CLEAR UNWANTED BITS
020346  020103                             CMP     R1,R3                         ;IF RECEIVED LINE=SELECTED LINE
020350  001002                             BNE     4$                            ;EXPECT LINE ENABLE AND
020352  012705  000031                     MOV     #LINENA+SECTX+SECRX,R5
                                                                                 ;SECONDARY RECEIVE IS SET
020356  020405                     4$:     CMP     R4,R5                         ;COMPARE EXPECTED AND
020360  001401                             BEQ     5$                            ;RECEIVED RESULTS
020362  104001                             HLT     1                             ;R5=EXPECTED R4=FOUND
020364  052777  000400  166706     5$:     BIS     #STEP,@MC.CSR                 ;UPDATE LINE COUNTER
020372  005302                             DEC     R2                            ;CONTINUE IF ALL CHECKS
020374  001355                             BNE     3$                            ;ARE NOT DONE FOR THIS LINE
020376  012705  000001                     MOV     #LINENA,R5                    ;EXPECT LINE ENABLE
020402  010103                     6$:     MOV     R1,R3                         ;ON SELECTED LINE
020404  010177  166670                     MOV     R1,@MC.CSR                    ;SELECT LINE
020410  042777  000010  166664             BIC     #SECTX,@MC.LSR                ;CLEAR SECONDARY TRANSMIT
020416  104414                             DELAY                                 ;DELAY FOR CABLE
020420  017704  166656                     MOV     @MC.LSR,R4                    ;READ LINE STATUS REGISTER
020424  020504                             CMP     R5,R4                         ;ONLY LINE ENABLE SHOULD BE
020426  001401                             BEQ     .+4                           ;SET ON THIS LINE
020430  104001                             HLT     1                             ;R5=EXPECTED R4=FOUND
020432  104401                             SCOP1
020434  005201                             INC     R1
020436  005077  166640                     CLR     @MC.LSR
020442  005300                             DEC     R0
020444  001320                             BNE     2$
020446  104400                     7$:     SCOPE                                 ;CHECK FOR ITERATIONS, LOOP
```

```
                                        ;************************ TEST 51 *******************************
                                        ;*DV11 SINGLE LINE CABLE TEST.
                                        ;*TEST TO RUN A 5 BIT BLOCK (000-037)
                                        ;*OF DATA FROM THE DV11 TRANSMITTER INTO THE
                                        ;*DV11 RECEIVER THROUGH THE CABLE.
                                        ;*SETUP:
                                        ;*MODE:          EXTERNAL LOOP BACK
                                        ;*TXBA:          SYNC
                                        ;*TXWC:          -42(8)-BIT15
                                        ;*RXBA           RXBA
                                        ;*RXWC:          -40(8)-BIT15
                                        ;*LINE PROTOCOL  TXDDCMP,RXDDCMP,LRC8,STRIP SYNC,IDLE MARK
                                        ;*LINE STATE     EXPECT BCC,TX GO
                                        ;*LINE PROGRESS  SEND BCC
                                        ;*NOTE: FOR TEST OF ASYNC LINE CARD;
                                        ;* ''SYNC 'A''' MUST BE SET TO ALL ZEROS
                                        ;*  IN SOFTWARE STATUS MAP.
                                        ;*
                                        ;:***************************************************************

                                ;  TEST 51
                                ;---------------
020450  012737  000051  001226  TST51:  MOV   #51,TSTNO
020456  012737  010064  001216          MOV   #TESTER,NEXT
020464  005737  007260                  TST   TURFLG
020470  001005                          BNE   88$
020472  013737  001216  001214          MOV   NEXT,RETURN
020500  000177  160510                  JMP   @RETURN
020504  104413                  88$:    RAMCLR                    ;CLEAR DV11
020506  032737  000010  007262          BIT #BIT3,LINE            ;DETERMINE LINE NO.
020514  001422                          BEQ   91$                 ;
020516  032737  000004  007262          BIT   #BIT2,LINE          ;
020524  001412                          BEQ   89$                 ;
020526  013737  001414  001244          MOV   MASK.D,MASKX        ;MASK PRRITY BIT IF SET          ;;++C
020534  113737  001430  023204          MOVB  L12.15,SYNC         ;SET SYNC FOR 12-15
020542  000430                          BR    100$                ;
020544  013737  001412  001244          MOV   MASK.C,MASKX        ;MASK PARITY BIT IF SET          ;;++C
020552  113737  001426  023204  89$:    MOVB  L08.11,SYNC         ;SET SYNC FOR 08-11
020560  000421                          BR    100$                ;
020562  032737  000004  007262  91$:    BIT   #BIT2,LINE          ;
020570  001412                          BEQ   90$                 ;
020572  013737  001410  001244          MOV   MASK.B,MASKX        ;MASK PARITY BIT IF SET          ;;++C
020600  113737  001424  023204          MOVB  L04.07,SYNC         ;SET SYNC FOR 04-07
020606  000406                          BR    100$                ;
020610  013737  001406  001244          MOV   MASK.A,MASKX        ;MASK PARITY BIT IF SET          ;;++C
020616  113737  001422  023204  90$:    MOVB  L00.03,SYNC         ;SET SYNC FOR 00-03
020624  113737  023204  023205  100$:   MOVB  SYNC,SYNC+1         ;MAKE SECOND SYNC
020632  012705  023606                  MOV   #TXTAB,R5           ;GET TABLE POINTER
020636  005004                          CLR   R4                  ;
020640  112725  000010          101$:   MOVB  #BIT3,(R5)+         ;''INC/BCC'' AND 'MODE 0''
020644  105204                          INCB  R4                  ;ALL DONE?
020646  001374                          BNE   101$                ;BR IF NO
020650  012705  023606                  MOV   #TXTAB,R5           ;SET POINTER
020654  005004                          CLR   R4                  ;
020656  113704  023204                  MOVB  SYNC,R4             ;SET SYNC CNTRL BYTE
020662  001405                          BEQ   102$                ;BR IF ASYNC LINE CARD!
```

```
020664  042704  177400                   BIC     #^C<377>,R4         ;
020670  060405                           ADD     R4,R5               ;
020672  112715  000040                   MOVB    #BIT5,(R5)          ;''MODE 1''
020676  012705  023206          102$:    MOV     #TXBAP,R5           ;

020702  005004                           CLR     R4                  ;
020704  110425                  1$:      MOVB    R4,(R5)+            ;LOAD DATA
020706  105204                           INCB    R4                  ;ALL DONE?
020710  022704  000040                   CMP     #40,R4              ;
020714  001373                           BNE     1$                  ;
020716  013777  007262  160446           MOV     LINE,@DVSRS         ;LOAD LINE NO
020724  105737  023204                   TSTB    SYNC                ;IS THIS AN ASYNC CARD?
020730  001006                           BNE     65$                 ;BR IF NO
020732  004537  023100                   PERFORM ,SETREG             ;
020736     000     001                   .BYTE   000,001             ;TXBAP, BYTE CNT
020740  023206                           TXBAP                       ;
020742  077740                           <-40>-BIT15                 ;
020744  000405                           BR      66$                 ;
020746  004537  023100          65$:     PERFORM ,SETREG             ;
020752     000     001                   .BYTE   000,001             ;TX BA, TX BC
020754  023204                           SYNC                        ;SYNC
020756  077736                           <-42>-BIT15                 ;MARKED BYTE COUNT
020760  004537  023100          66$:     PERFORM ,SETREG             ;
020764     004     005                   .BYTE   004,005             ;RX BA,BC
020766  024206                           RXBA                        ;
020770  077740                           <-40>-BIT15                 ;
020772  004537  023100                   PERFORM ,SETREG             ;
020776     012     013                   .BYTE   012,013             ;
021000  000143                           BIT6+BIT5+BIT1+BIT0         ;
021002  002004                           BIT10+BIT2                  ;
021004  004537  023100                   PERFORM ,SETREG             ;
021010     016     014                   .BYTE   016,014             ;
021012  002000                           BIT10                       ;
021014  000001                           001                         ;IF SYNC LINE CARD; START IN MODE 1
021016  105737  023204                   TSTB    SYNC                ;IF ASYNC LINE CARD;
021022  001002                           BNE     .+6                 ;SET TX TO MODE 0
021024  005077  160346                   CLR     @DVSRA              ;WHICH IS TRUE DDCMP MODE!
021030  004537  023100                   PERFORM ,SETREG             ;
021034     010     010                   .BYTE   010,010             ;
021036  023206                           TXTAB-400                   ;
021040  023206                           TXTAB-400                   ;
021042  105737  023204                   TSTB    SYNC                ;ASYNC LINE CARD?
021046  001012                           BNE     67$                 ;BR IF NOT ASYNC
021050  004537  023144                   PERFORM ,LOAD.MODE          ;
021054  015000                           <BIT12+BIT11>+BIT9          ;8 BITS/PER/CHAR.
021056  004537  023144                   PERFORM ,LOAD.MODE          ;
021062  020000                           BIT13                       ;RX ENABLE
021064  004537  023144                   PERFORM ,LOAD.MODE          ;
021070  072000                           <BIT14+BIT13+BIT12>+BIT10 ;9600 BAUD.
021072  000403                           BR      68$                 ;
021074  004537  023144          67$:     PERFORM ,LOAD.MODE          ;MODE FOR CABLE TESTING
021100  030000                           BIT13+BIT12                 ;
021102  005277  160254          68$:     INC     @DVSCR              ;SET GO
021106  005005                           CLR     R5                  ;
021110  105777  160246          2$:      TSTB    @DVSCR              ;RX BIT7=1?
021114  100404                           BMI     3$                  ;YES
```

```
021116  104414                        DELAY                         ;WASTE TIME
021120  005205                        INC     R5                    ;DELAY
021122  001372                        BNE     2$                    ;
021124  104000                        HLT                           ;NO SCR BIT7=1
021126  013705  007262        3$:     MOV     LINE,R5               ;GET LINE NUMBER
021132  000305                        SWAB    R5                    ;PUT IN HIGH BYTE
021134  052705  050000                BIS     #BIT14+BIT12,R5       ;
021140  017704  160222                MOV     @DVRIC,R4             ;READ RIC
                              ;;******************************************************************
021144  143704  001244                BICB    MASKX,R4              ;CLEAR PARITY BIT                ;;++C
                                                                    ;PARITY BIT IS APPENDED
                                                                    ;TO HIGH BIT OF CHARACTER
                                                                    ;WHEN PARITY ENABLED.
                              ;;******************************************************************
021150  020504                        CMP     R5,R4                 ;OK?
021152  001401                        BEQ     4$                    ;YES
021154  104000                        HLT                           ;
021156  005005                4$:     CLR     R5                    ;
021160  005004                        CLR     R4                    ;
021162  012701  023206                MOV     #TXBAP,R1             ;CHECK DATA!!
021166  012700  024206                MOV     #RXBA,R0              ;
021172  012702  000040                MOV     #40,R2                ;
021176  112004                5$:     MOVB    (R0)+,R4              ;GET RX DATA
021200  042704  177740                BIC     #^C<37>,R4            ;
021204  112105                        MOVB    (R1)+,R5              ;GET TX DATA
021206  020504                        CMP     R5,R4                 ;OK?
021210  001401                        BEQ     6$                    ;
021212  104000                        HLT                           ;RX DATA BAD!!
021214  005302                6$:     DEC     R2                    ;DONE?
021216  001367                        BNE     5$                    ;
021220  104412                        MSTCLR                        ;INIT DV11
021222  104400                        SCOPE                         ;SCOPE TEST.
```

```
        021224                  LOVE=.
        000210                  .=210
000210  000137  021224                  JMP     MANUAL
        021224                  .=LOVE
021224  012706  001200          MANUAL: MOV     #STACK,SP
021230  012700  001500                  MOV     #DV.MAP,R0
021234  005020                  1$:     CLR     (R0)+
021236  022700  001740                  CMP     #DV.END,R0
021242  001374                          BNE     1$
021244  104402  022253                  TYPE    ,MXTITLE
021250  004737  022760                  JSR     PC,TKRDY
021254  113737  001272  001301          MOVB    SAVR5,DVNUM
021262  142737  177760  001301          BICB    #^C<17>,DVNUM
021270  112737  000001  001303          MOVB    #1,SAVNUM
021276  012700  001500                  MOV     #DV.MAP,R0
021302  012705  000001          2$:     MOV     #1,R5
021306  104402  022355                  TYPE    ,MXGIVE
021312  113737  001303  001266          MOVB    SAVNUM,SAVR3
021320  104411  023044                  CNVRT   ,XXLIN
021324  104403  022367                  INSTR   ,MXSCR
021330  104405                          PARAM
021332  175000                          175000
021334  175400                          175400
021336  001256                          TEMP5
021340     007     001                  .BYTE   7,1
021342  013720  001256                  MOV     TEMP5,(R0)+
021346  104403  022412                  INSTR   ,MXVEC
021352  104405                          PARAM
021354  000300                          300
021356  000770                          770
021360  001256                          TEMP5
021362     007     001                  .BYTE   7,1
021364  013720  001256                  MOV     TEMP5,(R0)+
021370  113746  001303          65$:    MOVB    SAVNUM,-(SP)
021374  110537  001303                  MOVB    R5,SAVNUM
021400  104402  022544                  TYPE    ,MXGV
021404  113737  001303  001266          MOVB    SAVNUM,SAVR3
021412  104411  023044                  CNVRT   ,XXLIN
021416  112637  001303                  MOVB    (SP)+,SAVNUM
021422  104402  022563                  TYPE    ,MXINST
021426  004737  022760                  JSR     PC,TKRDY
021432  042737  000040  001272          BIC     #40,SAVR5
021440  022737  000131  001272          CMP     #131,SAVR5
021446  001402                          BEQ     .+6
021450  052710  100000                  BIS     #BIT15,(R0)
021454  005710                          TST     (R0)
021456  100532                          BMI     70$
021460  104402  022611                  TYPE    ,MASYNC
021464  004737  022760                  JSR     PC,TKRDY
021470  042737  000040  001272          BIC     #40,SAVR5
021476  022737  000116  001272          CMP     #116,SAVR5
021504  001405                          BEQ     66$
021506  012710  004000                  MOV     #ASYNC,(R0)
021512  005060  000002                  CLR     2(R0)
021516  000512                          BR      70$
021520  104403  022376          66$:    INSTR   ,MXSY1A
```

```
021524  104405                                  PARAM
021526  000001                                  001
021530  000376                                  376
021532  001256                                  TEMP5
021534     000     001                          .BYTE   0,1
021536  113710  001256                          MOVB    TEMP5,(R0)
021542  104403  022424                          INSTR   .MXSY1B
021546  104405                                  PARAM
021550  000001                                  001
021552  000376                                  376
021554  001256                                  TEMP5
021556     000     001                          .BYTE   0,1
021560  113760  001256  000002                  MOVB    TEMP5,2(R0)
021566  104402  022440                          TYPE    .MXBITS
021572  004737  022760                          JSR     PC,TKRDY
021576  042737  177770  001272                  BIC     #^C<7>,SAVR5
021604  032737  000007  001272  3$:             BIT     #7,SAVR5
021612  001405                                  BEQ     4$
021614  062710  000400                          ADD     #400,(R0)
021620  005237  001272                          INC     SAVR5
021624  000767                                  BR      3$
                                ;;*****************************************************************************************
021626  104402  022461          4$:             TYPE    .MPARITY            ;SEE IF PARITY ENABLED          ;;++C
021632  004737  022760                          JSR     PC,TKRDY
021636  042737  000040  001272                  BIC     #40,SAVR5
021644  022737  000131  001272                  CMP     #'Y,SAVR5           ;IF ANSWER IS YES(Y)
021652  001017                                  BNE     5$                  ;SET BIT14 OF STAT
021654  052710  040000                          BIS     #PARBIT,(R0)        ;TO ENABLE PARITY
021660  104402  022514                          TYPE    .MPEVEN             ;SEE IF PARITY EVEN
021664  004737  022760                          JSR     PC,TKRDY
021670  042737  000040  001272                  BIC     #40,SAVR5
021676  022737  000131  001272                  CMP     #'Y,SAVR5           ;IF EVEN PARITY SELECTED
021704  001002                                  BNE     5$                  ;SET BIT13 IN STAT
021706  052710  020000                          BIS     #BIT13,(R0)
                                ;;*****************************************************************************************
021712  104402  022643          5$:             TYPE    .MXSYN
021716  004737  022760                          JSR     PC,TKRDY
021722  042737  000040  001272                  BIC     #40,SAVR5
021730  022737  000131  001272                  CMP     #131,SAVR5
021736  001402                                  BEQ     .+6
021740  052710  010000                          BIS     #BIT12,(R0)
021744  022020                  70$:            CMP     (R0)+,(R0)+
021746  005205                                  INC     R5
021750  022705  000005                          CMP     #5,R5
021754  001402                                  BEQ     6$
021756  000137  021370                          JMP     65$
021762  105237  001303          6$:             INCB    SAVNUM
021766  123737  001303  001301                  CMPB    SAVNUM,DVNUM
021774  101002                                  BHI     .+6
021776  000137  021302                          JMP     2$
022002  105037  001300                          CLRB    DVACTV
022006  113737  001301  001303                  MOVB    DVNUM,SAVNUM
022014  113701  001301                          MOVB    DVNUM,R1
022020  000241                                  CLC
022022  106137  001300                          ROLB    DVACTV
022026  105237  001300                          INCB    DVACTV
```

```
022032  105301                                  DECB    R1
022034  001371                                  BNE     .-14
022036  113737  001300  001302                  MOVB    DVACTV,SAVACT
022044  012710  177777                          MOV     #177777,(R0)
022050  104402  022056                          TYPE    ,MXFIN
022054  000000                                  HALT
022056  177777  051440  040524  MXFIN:  .ASCIZ  <377><377>/ START DIAGNOSTICS WITH SW07=1!/<212>
022121     377  042523  042514  MSEL:   .ASCII  <377>/SELECT LINE(S) XXXXXXXXXXXXXXXX/
022161     377  020040  020040          .ASCIZ  <377>/                /
022202  046377  047111  051505  MLINE:  .ASCIZ  <377>/LINES SELECTED(8):  /<377>
022231     056  000377          M.CRLF: .ASCIZ  /./<377>
022234  051777  047111  046107  MSING:  .ASCIZ  <377>/SINGLE LINE: /
022253                          MXTITLE:
022253     212  053104  030461          .ASCII  <212>/DV11 MANUAL PARAMETER INPUT PROGRAM./
022320  042377  030526  023461          .ASCIZ  <377>/DV11'S IN SYSTEM (1 TO 8): /
022355     212  053104  030461  MXGIVE: .ASCIZ  <212>/DV11 #: /
022367     377  051503  035122  MXSCR:  .ASCIZ  <377>/CSR: /
022376  051777  047131  020103  MXSY1A: .ASCIZ  <377>/SYNC ''A'': /
022412  053377  041505  047524  MXVEC:  .ASCIZ  <377>/VECTOR: /
022424  051777  047131  020103  MXSY1B: .ASCIZ  <377>/SYNC ''B'': /
022440  041377  052111  026523  MXBITS: .ASCIZ  <377>/BITS-PER-CHAR: /
022461     377  040520  044522  MPARITY:.ASCIZ  <377>/PARITY ENABLED?(Y OR N): /
022514  050377  051101  052111  MPEVEN: .ASCIZ  <377>/PARITY EVEN?(Y OR N): /
022544  046212  047111  020105  MXGV:   .ASCIZ  <212>/LINE CARD #: /
022563     377  047111  052123  MXINST: .ASCIZ  <377>/INSTALLED?(Y OR N): /
022611     377  051501  047131  MASYNC: .ASCIZ  <377>/ASYNCHRONOUS ?(Y OR N): /
022643     377  053524  020117  MXSYN:  .ASCIZ  <377>/TWO SYNCS? (Y OR N): /
022672  024377  024501  044040  MTURN:  .ASCIZ  <377>/(A) H325/<377>/(B) H861/<377>/TYPE ''A'' OR ''B'': /
022737     377  047515  042504  MVECZ:  .ASCIZ  <377>/MODEM VECTOR: /
        022760                          .EVEN
022760  105777  156220          TKRDY:  TSTB    @TKCSR
022764  100375                          BPL     .-4
022766  017746  156214                  MOV     @TKDBR,-(SP)
022772  042716  000200                  BIC     #BIT7,(SP)
022776  032716  000100                  BIT     #BIT6,(SP)              ;CHAR OR NUMBER
023002  001402                          BEQ     .+6                     ;BR IF NUMBER
023004  042716  000040                  BIC     #BIT5,(SP)              ;MAKE UPPER CASE
023010  022716  000015                  CMP     #15,(SP)
023014  001411                          BEQ     1$
023016  011637  001272                  MOV     (SP),SAVR5
023022  105777  156162                  TSTB    @TPCSR
023026  100375                          BPL     .-4
023030  011677  156156                  MOV     (SP),@TPDBR
023034  005726                          TST     (SP)+
023036  000750                          BR      TKRDY
023040  005726                  1$:     TST     (SP)+
023042  000207                          RTS     PC
023044  000001                  XXLIN:  1
023046     002     001                  .BYTE   2,1
023050  001266                          SAVR3

023052                          CKBIT15:
023052  010046                          MOV     R0,-(SP)
023054  005000                          CLR     R0
023056  005777  156306          64$:    TST     @DVLCR
023062  100004                          BPL     65$
```

```
023064  104414                                  DELAY
023066  005200                                  INC     R0
023070  001372                                  BNE     64$
023072  104000                                  HLT     0                   ;BIT 15 FAILED TO CLEAR
023074  012600                          65$:    MOV     (SP)+,R0
023076  000207                                  RTS     PC
023100  010046                          SETREG: MOV     R0,-(SP)
023102  010146                                  MOV     R1,-(SP)
023104  112500                                  MOVB    (R5)+,R0
023106  112501                                  MOVB    (R5)+,R1
023110  110077  156260                          MOVB    R0,@DVSRSH
023114  012577  156256                          MOV     (R5)+,@DVSRA
023120  042777  000060  156234                  BIC     #BIT5+BIT4,@DVSCR
023126  110177  156242                          MOVB    R1,@DVSRSH
023132  012577  156240                          MOV     (R5)+,@DVSRA
023136  012601                                  MOV     (SP)+,R1
023140  012600                                  MOV     (SP)+,R0
023142  000205                                  EXIT

023144                                  LOAD.MODE:
023144  012577  156220                          MOV     (R5)+,@DVLCR
023150  052777  100000  156212                  BIS     #BIT15,@DVLCR
023156  010046                                  MOV     R0,-(SP)
023160  005000                                  CLR     R0
023162  005777  156202                  1$:     TST     @DVLCR
023166  100004                                  BPL     2$
023170  104414                                  DELAY
023172  005200                                  INC     R0
023174  001372                                  BNE     1$
023176  104000                                  HLT     0                   ;BIT 15 FAILED TO CLEAR
023200  012600                          2$:     MOV     (SP)+,R0
023202  000205                                  EXIT
023204  000001                          SYNC:   .BLKW 1
023206  000400                          TXBAP:  .BLKB   400
023606  000400                          TXTAB:  .BLKB   400
024206  000400                          RXBA:   .BLKB   400
024606  051777  047111  046107          EM1:    .ASCII  <377>/SINGLE LINE CABLE TESTS(DV11 ERROR)/
024652  051377  053103  020122                  .ASCIZ  <377>/RCVR INTERRUPT (BIT 7 OF DVSCR) FAILED TO SET/
024731     377  040503  046102          EM2:    .ASCIZ  <377>/CABLE TURN AROUND TESTS (MODEM CONTROL ERROR)/
025010  046777  042117  046505          EM3:    .ASCIZ  <377>/MODEM CONTROL ERROR/
025035     377  054105  042520          DH4:    .ASCIZ  <377>/EXPECTED  FOUND  REGISTER/
025070  052777  042516  050130          EM4:    .ASCIZ  <377>/UNEXPECTED MODEM CONTROL INTERUPT./
025134  046777  042117  046505          EM5:    .ASCIZ  <377>/MODEM CONTROL FAILED TO INTERUPT/
025176  051377  040505  044504          EM6:    .ASCIZ  <377>/READING MODEM CONTROL CAUSED AT TRAP TO 4./
025252  042777  050130  041505          DH1:    .ASCIZ  <377>/EXPECTED  FOUND  LINE  DVSCR  MC.CSR/
                                                .EVEN
025320  000005                          DT1:    5
025322     006     004                          .BYTE 6,4
025324  001272                                  SAVR5
025326     006     001                          .BYTE   6,1
025330  001270                                  SAVR4
025332     002     004                          .BYTE   2,4
025334  007262                                  LINE
025336     006     001                          .BYTE   6,1
025340  001362                                  DVSCR
025342     006     001                          .BYTE 6,1
```

```
 3262  025344  007300                     MC.CSR
 3263  025346  000003           DT2:      3
 3264  025350     006     004             .BYTE   6,4
 3265  025352  001272                     SAVR5
 3266  025354     006     001             .BYTE   6,1
 3267  025356  001270                     SAVR4
 3268  025360     006     001             .BYTE   6,1
 3269  025362  001266                     SAVR3
 3270  025364                   .ERRTAB:
 3271  025364  024606                     EM1
 3272  025366  025252                     DH1
 3273  025370  025320                     DT1
 3274  025372  024731                     EM2
 3275  025374  025252                     DH1
 3276  025376  025320                     DT1
 3277  025400  025010                     EM3
 3278  025402  025035                     DH4
 3279  025404  025346                     DT2
 3280  025406  025070                     EM4
 3281  025410  000000                     0
 3282  025412  000000                     0
 3283  025414  025134                     EM5
 3284  025416  000000                     0
 3285  025420  000000                     0
 3286  025422  025176                     EM6
 3287  025424  000000                     0
 3288  025426  000000                     0
 3289  025430  000000                     0
 3290  025432  000000                     0
 3291  025434  000000                     0
 3292          000001           .END
```

```
ADRCNT= 003443     619*    655*    664#
ALU   = 010000      73#
ASYNC = 004000      81#   3141
AUTO.S  006624    1129#
BCC   = 060000      78#
BINWRD  003746     705*    706     743#
BIT0  = 000001      71#    886    1230    3026
BIT1  = 000002      70#    886     897    1233    3026
BIT10 = 002000      61#    886    3027    3030    3046
BIT11 = 004000      60#    886    1446    3042
BIT12 = 010000      59#     73      75      77      79    3042    3046    3049    3060    3185
BIT13 = 020000      58#     74      75      78      79    3044    3046    3049    3178
BIT14 = 040000      57#     76      77      78      79     526    3046    3060
BIT15 = 100000      56#   3014    3019    3023    3133    3237
BIT2  = 000004      69#    453     886    1234    2973    2981    3027
BIT3  = 000010      68#    886    1235    2971    2991
BIT4  = 000020      67#   1236    3228
BIT5  = 000040      66#   1237    3000    3026    3207    3228
BIT6  = 000100      65#   1197    1238    3026    3207
BIT7  = 000200      64#    520     767     924     945    1197    1239    1449    3207
BIT8  = 000400      63#    886     903
BIT9  = 001000      62#    886    1197    1202    3042
BRB   = 070000      79#
BRW     003014     459     548#
BRX     003016     460     549#
BUSY  = 000020    1215#   1623    1632    1959    1991    2200
CHAR    007266    1244#   1416*   1425    1437*
CHRCNT  003744     703*    707     723*    741#    742
CKBIT1  023052    3211#
CLKX    001242     150#
CLK.A   001416     250#   1047
CLK.B   001417     251#   1052
CLK.C   001420     252#   1057
CLK.D   001421     253#   1062
CLRMUX= 002000    1221#   1937    2082    2115    2192    2253    2300    2347    2394    2584    2638    2692    2746
CLRSCN= 004000    1222#   1958    1990    2199
CNVRT = 104411     209#    478     480     482     484     804     806     862     919    1391    3107    3126
CO    = 000100    1238#   2499    2811
COF   = 040000    1225#
CONVRT= 104410     207#    418     820
COUNT   007270    1245#   1414*   1426*   1428*   1435*
CREAM   001306     171#    387*    994*    995     997*   1002    1003*   1004    1007*
CS    = 000040    1237#   2499    2811
CSF   = 020000    1224#
CSRMAP  006626     412    1131#
CYCLE   005666     462     498     499     984#
DATABP  004276     793*    796     818     821#
DATACL= 104416     219#
DATAHD  004264     792*    814     817#
DELAY = 104414     215#   1913    1948    1965    2002    2046    2135    2213    2276    2323    2370    2417    2464
                  2511    2558    2608    2662    2716    2770    2823    2877    2931    3054    3216    3242
DEVADR  003440     617*    652     662#
DH1     025252    3252#   3272    3275
DH4     025035    3252#   3278
DONE  = 000200    1218#   1540    1542    1543    1547    1548    1550    1651    1695    1717    1738    1759    1780
                  1801    1822    1843    1864    2152    2230
```

```
DSR   = 000020      1236#     2546
DT1     025320      3252#     3273      3276
DT2     025346      3263#     3279
DVACTV  001300       165#      434*      435       984       989      1163*     1169*     1170*     1174      1193      3195*     3199*     3200*
                    3203
DVCR00  001500       283#
DVCR01  001524       294#
DVCR02  001550       305#
DVCR03  001574       316#
DVCR04  001620       327#
DVCR05  001644       338#
DVCR06  001670       349#
DVCR07  001714       360#
DVLCR   001370       233#      903*      904      1023*     1024*     1025      3214      3236*     3237*     3240
DVNSR   001402       238#     1033*     1034*     1035
DVNUM   001301       166#      383       488      1135*     1156*     1157      1164      1166      3100*     3101*     3192      3196      3197
DVRIC   001366       232#     1021*     1022*     1023      3061
DVRLVL  001354       227#     1038*     1039*     1040
DVRVEC  001352       226#      505      1009*     1038
DVSCR   001362       230#      502       880*      893*      897*     1008*     1019      1326      1402      1410      3050*     3052      3228*
                    3260
DVSCRH  001364       231#     1019*     1020*     1021
DVSFR   001400       237#     1031*     1032*     1033
DVSRA   001376       236#      884      1029*     1030*     1031      3034*     3227*     3230*
DVSRS   001372       234#      883      1025*     1026*     1027      3008*
DVSRSH  001374       235#     1027*     1028*     1029      3226*     3229*
DVTLVL  001360       229#     1042*     1043*
DVTR00  001502       284#
DVTR01  001526       295#
DVTR02  001552       306#
DVTR03  001576       317#
DVTR04  001622       328#
DVTR05  001646       339#
DVTR06  001672       350#
DVTR07  001716       361#
DVTVEC  001356       228#     1040*     1041*     1042
DV.END  001740       371#      995      1004      1133      3096
DV.MAP  001500       171       282#      387       414       997      1007      1131      1136      1185      3094      3103
DV00.A  001504       285#
DV00.B  001510       287#
DV00.C  001514       289#
DV00.D  001520       291#
DV01.A  001530       296#
DV01.B  001534       298#
DV01.C  001540       300#
DV01.D  001544       302#
DV02.A  001554       307#
DV02.B  001560       309#
DV02.C  001564       311#
DV02.D  001570       313#
DV03.A  001600       318#
DV03.B  001604       320#
DV03.C  001610       322#
DV03.D  001614       324#
DV04.A  001624       329#
DV04.B  001630       331#
```

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DV04.C  001634        333#
DV04.D  001640        335#
DV05.A  001650        340#
DV05.B  001654        342#
DV05.C  001660        344#
DV05.D  001664        346#
DV06.A  001674        351#
DV06.B  001700        353#
DV06.C  001704        355#
DV06.D  001710        357#
DV07.A  001720        362#
DV07.B  001724        364#
DV07.C  001730        366#
DV07.D  001734        368#
EM1     024606       3252#   3271
EM2     024731       3252#   3274
EM3     025010       3252#   3277
EM4     025070       3252#   3280
EM5     025134       3252#   3283
EM6     025176       3252#   3286
ERRCNT  001232        142#    389*    511     829*
ERRFLG  001311        177#    385*    473*    540*    781*    794     808*    863*
ERRMSG  004252        791*    809     812#
ERTAB0  004366        806     838#
EXERCI  007274       1247#   1418*   1421*   1439*
EXIT  = 000205         81#   3233    3247
EXITER  004322        824     829#
FIX.00  006516       1048    1053    1058    1063    1097#
HALTS   004302        777     823#
HILIM   003436        616*    643     661#
ICOUNT  001222        138#    538     543*
INBUF   005520        586     622     969#
INIFLG  001310        176#    394     409*
INSTER= 104404        199#    637
INSTR = 104403        197#   1070    1350    1404    3108    3115    3144    3151
INSTR2  003236        593     605#
INTENA= 000100       1217#   1513    1515    1516    1520    1521    1523    1672    1692    1716    1737    1758    1779
                     1800    1821    1842    1863    2128    2206
KBISR   010276       1330    1451    1456#
LIGHT   000174        110#    404
LIGHTS  001200        121#    404*    475*
LIMITS  003364        632     643#
LINE    007262       1242#   1354    1357*   1419*   1420*   1440*   2252    2299    2346    2393    2441    2488    2535
                     2587*   2641*   2695*   2749*   2971    2973    2981    3008    3058    3258
LINENA= 000001       1230#   2091    2121    2256    2264    2444    2452    2460    2491    2499    2507    2538    2546
                     2554    2588    2596    2803    2811    2819    2857    2865    2873    2911    2919    2927
LOAD.M  023144       3041    3043    3045    3048    3235#
LOBITS  003442        618*    647     663#    664
LOCK    001220        137#    542*    556     558     800    1879*   1905*   1935*   1957*   1984*   2028*   2071*   2113*
                     2168*   2583*   2637*   2691*   2745*   2800*   2854*   2908*
LOGICA  002560        107     492#
LOKFLG  001312        178#
LOLIM   003434        615*    645     660#
LOVE  = 021224       3089#   3092
LPCNT   001224        139#    537*    538     541*
LSTERR  001234        143#    390*    472*    524*    778     780*    864*
```

```
L00.03  001422            255#   1010*   1045    2170    2987
L04.07  001424            256#   1012*   1050    2173    2984
L08.11  001426            257#   1014*   1055    2176    2979
L12.15  001430            258#   1016*   1060    2179    2976
MAINT = 001000           1220#   1567    1569    1570    1574    1575    1577    1940    1993    1996    2035    2119
MANUAL  021224           3091    3093#
MAR18 = 007502           1349#   1461
MASKX   001244            151#   2975*   2978*   2983*   2986*   3063
MASK.A  001406            245#   1046    2986
MASK.B  001410            246#   1051    2983
MASK.C  001412            247#   1056    2978
MASK.D  001414            248#   1061    2975
MASTEK  005400            802     960#
MASYNC  022611           3136    3207#
MCRLF   005104            571     694     798     799     807     948     960#   1069    1087
MCSRX   005330            477     960#
MC.CSR  007300           1249#   1326*   1327*   1328    1488    1512    1539    1566    1593    1619    1648*   1651*   1669*
                         1672*   1690*   1692*   1695*   1712*   1716*   1717*   1733*   1737*   1738*   1754*   1758*   1759*
                         1775*   1779*   1780*   1796*   1800*   1801*   1817*   1821*   1822*   1838*   1842*   1843*   1859*
                         1863*   1864*   1880    1906    1936    1985    2029    2072    2114    2190    2250*   2253*   2255*
                         2257*   2260    2269*   2273*   2297*   2300*   2302*   2304*   2307    2316*   2320*   2344*   2347*
                         2349*   2351*   2354    2363*   2367*   2391*   2394*   2396*   2398*   2401    2410*   2414*   2439*
                         2443*   2445*   2448    2457*   2462*   2486*   2490*   2492*   2495    2504*   2509*   2533*   2537*
                         2539*   2542    2551*   2556*   2579*   2584*   2586*   2589*   2592    2601*   2605*   2633*   2638*
                         2640*   2643*   2646    2655*   2659*   2687*   2692*   2694*   2697*   2700    2709*   2713*   2741*
                         2746*   2748*   2751*   2754    2763*   2767*   2796*   2802*   2804*   2807    2816*   2821*   2850*
                         2856*   2858*   2861    2870*   2875*   2904*   2910*   2912*   2915    2924*   2929*   3262
MC.LSR  007302           1250#   1328*   1329*   1492    2076*   2084    2091*   2092    2098*   2121*   2195*   2256*   2259
                         2275*   2277    2303*   2306    2322*   2324    2350*   2353    2369*   2371    2397*   2400    2416*
                         2418    2444*   2447    2463*   2465    2491*   2494    2510*   2512    2538*   2541    2557*   2559
                         2588*   2591    2607*   2609    2642*   2645    2661*   2663    2696*   2699    2715*   2717    2750*
                         2753    2769*   2771    2803*   2806    2822*   2824    2830*   2857*   2860    2876*   2878    2884*
                         2911*   2914    2930*   2932    2938*
MC.LVL  007306           1252#   1411*   1412*   1650*   1671*   1693*   1715*   1736*   1757*   1778*   1798*   1819*   1840*
                         1861*   2126*   2205*
MC.VEC  007304           1251#   1408    1411    1649*   1670*   1691*   1714*   1735*   1756*   1777*   1797*   1818*   1839*
                         1860*   2125*   2204*
MDATA   005624            721     731     973#
MEPASS  005145            476     960#
MERRPC  005454            805     960#
MERRX   005355            483     960#
MERR2   005174            960#    986    1176
MERR3   005243            431     960#
MLINE   022202           1387    3207#
MLOCK   005301            455     960#
MNEW    005402            426     960#
MPARIT  022461           3167    3207#
MPASSX  005344            481     960#
MPEVEN  022514           3173    3207#
MPFAIL  005107            861     960#
MQM     005100            601     960#   1092
MR      005171            463     960#
MRESET= 004000             81#    880     893
MSEL    022121           1362    3207#
MSING   022234           1350    3207#
MSTCLR= 104412            211#    865    3084
```

```
MTITLE  001000            119#     408
MTSTN   005366            803      960#    1071
MTSTPC  005267            960#
MTURN   022672           1336     3207#
MVECX   005336            479      960#
MVECZ   022737           1404     3207#
MXBITS  022440           3158     3207#
MXFIN   022056           3205     3207#
MXGIVE  022355           3105     3207#
MXGV    022544           3124     3207#
MXINST  022563           3128     3207#
MXSCR   022367           3108     3207#
MXSYN   022643           3180     3207#
MXSY1A  022376           3144     3207#
MXSY1B  022424           3151     3207#
MXTITL  022253           3098     3207#
MXVEC   022412           3115     3207#
M.CRLF  022231           1395     3207#
NEXT    001216            136#     544      834     1324*    1443*    1475*    1511*    1538*    1565*    1592*    1618*    1646*    1667*
                         1688*    1711*    1732*    1753*    1774*    1795*    1816*    1837*    1858*    1878*    1904*    1934*    1983*
                         2027*    2070*    2112*    2167*    2188     2245*    2248     2292*    2295     2339*    2342     2386*    2389
                         2434*    2437     2481*    2484     2528*    2531     2574*    2577     2628*    2631     2682*    2685     2736*
                         2739     2791*    2794     2845*    2848     2899*    2902     2965*    2968
NPR   = 040000             76#
NS    = 000010           1235#    2397     2405     2538     2546     2557
PARAM = 104405            201#    1072     1351     1405     3109     3116     3145     3152
PARAM1  003304            621#     638
PARBIT= 040000             81#    1116     3172
PARERR  003360            624      626      628      637#     644      646      648
PASCNT  001230            141#     384*     474*     475      508
PERFOR= 004537             81#    3011     3016     3020     3024     3028     3035     3041     3043     3045     3048
PFTAB   004470            862      868#
POINTE  007264           1243#    1413*    1414     1415*    1416     1417*    1428     1434*    1435     1436*    1437     1438*
POPRO = 012600             55#     828
POP1SP= 005726             55#
POP2SP= 022626             55#     546     1655     1676     1699     1720     1741     1762     1783     1805     1826     1847     1868
                         2146     2224
PS    = 177776             53#     380*     449*    1196*    1325*    1333*    1388*    1647*    1652*    1668*    1673*    1689*    1694*
                         1713*    1734*    1755*    1776*    1799*    1820*    1841*    1862*    1882*    1907*    1938*    1987*    2031*
                         2074*    2117*    2126     2129*    2131*    2141*    2194*    2205     2207*    2209*    2219*    2251*    2298*
                         2345*    2392*    2440*    2487*    2534*    2580*    2634*    2688*    2742*    2797*    2851*    2905*
PUSHRO= 010046             55#     825
PUSH1S= 005746             55#
PUSH2S= 024646             55#
QV.FLG  001313            179#     386*     487*     535     1424*
RAM   = 020000             74#
RAMCLR= 104413            213#     866     2970
RESREG  004300            819      822#
RESTAR  004414            849      855#
RESTRT  002572            486      490      498#
RESV16  001404            239#    1035*    1036*
RES05 = 104407            205#     822
RETURN  001214            135#     392*     462*     464      498*     544*     547      834*     836      867     1086*    1094*    1095
                         1432*    1433     1442*    1443     1454     1500     2188*    2189     2248*    2249     2295*    2296     2342*
                         2343     2389*    2390     2437*    2438     2484*    2485     2531*    2532     2577*    2578     2631*    2632
                         2685*    2686     2739*    2740     2794*    2795     2848*    2849     2902*    2903     2968*    2969
```

```
RING   = 000200      1239#   2452     2865
RINGF  = 100000      1226#
ROMCLK= 104415        217#
RS     = 000004      1234#   2350     2358     2491     2499     2510     2696     2704     2857     2865     2876
RUN      001304       169#    388*     989      992*     993*    1000*    1001*
RXBA     024206      3022    3074     3251#
SAVACT   001302       167#    429     1174*    3203*
SAVNUM   001303       168#    383*     485*     488*    1167*    3102*    3106     3122     3123*    3125     3127*    3191*    3192
                     3196*
SAVPC    001276       164#    669*     840
SAVR0    001260       157#    678*     683
SAVR1    001262       158#    677*     684
SAVR2    001264       159#    676*     685
SAVR3    001266       160#    675*     686     1385*    1392*    1393     3106*    3125*    3209     3269
SAVR4    001270       161#    674*     687     2132*    2138*    2210*    2216*    3256     3267
SAVR5    001272       162#    673*     688     1338     1342     3100     3130*    3131     3138*    3139     3160*    3161     3164*
                     3169*   3170     3175*    3176     3182*    3183     3207*    3254     3265
SAVSP    001274       163#
SAV05  = 104406       203#    782
SCNENA= 000040       1216#   1594     1596     1597     1601     1602     1604     1620     1627     2130     2152     2208     2230
SCOPE  = 104400       191#   1497     1527     1554     1581     1608     1636     1657     1678     1700     1722     1743     1764
                     1785    1806     1827     1848     1869     1894     1922     1974     2017     2061     2101     2156     2234
                     2281    2328     2375     2422     2469     2516     2563     2617     2671     2725     2779     2833     2887
                     2941    3085
SCOP1  = 104401       193#   1890     1918     1953     1970     2011     2055     2089     2096     2144     2151     2222     2229
                     2613    2667     2721     2775     2828     2882     2936
SECRX  = 000020      1232#   2919
SECRXF= 010000       1223#
SECTX  = 000010      1231#   2750     2758     2911     2919     2930
SELECT   007272      1246#   1345*    1356*    1360*    1363     1364*    1372*    1381*    1383     1386     1418     1439
SERV.G   004640       523     770      914#     915
SETREG   023100      3011    3016     3020     3024     3028     3035     3222#
SPACNT= 003745        704*    725      728*     742#
SSWR     000176       112#    405
STACK  = 001200        54#    381      450      835      857     1499     3093
STAT     001236       148#
STEP   = 000400      1219#   1912     1941     1947     1964     1995     2001     2036     2040     2045     2077     2120     2196
                     2269    2316     2363     2410     2457     2504     2551     2601     2655     2709     2763     2816     2870
                     2924
SV05     003452       673#
SWR      001202       123#    400      405*     410      424      429      434      453      517      526      533      554      567
                      764     771      776      823      830      832      916      917*     927*     932*     933*     934*     941*
                     1064    1347
SW00   = 000001        34#    424
SW01   = 000002        33#   1064
SW02   = 000004        32#
SW03   = 000010        31#
SW04   = 000020        30#
SW05   = 000040        29#
SW06   = 000100        28#   1347
SW07   = 000200        27#
SW08   = 000400        26#    830
SW09   = 001000        25#    554
SW10   = 002000        24#    832
SW11   = 004000        23#    533
SW12   = 010000        22#    567      771
```

```
SW13    = 020000          21#    776
SW14    = 040000          20#
SW15    = 100000          19#
SYNA00    001506         286#
SYNA01    001532         297#
SYNA02    001556         308#
SYNA03    001602         319#
SYNA04    001626         330#
SYNA05    001652         341#
SYNA06    001676         352#
SYNA07    001722         363#
SYNB00    001512         288#
SYNB01    001536         299#
SYNB02    001562         310#
SYNB03    001606         321#
SYNB04    001632         332#
SYNB05    001656         343#
SYNB06    001702         354#
SYNB07    001726         365#
SYNC      023204        2976*   2979*   2984*   2987*   2988*   2996    3009    3018    3032    3039    3248#
SYNCX     001240         149#
SYNC00    001516         290#
SYNC01    001542         301#
SYNC02    001566         312#
SYNC03    001612         323#
SYNC04    001636         334#
SYNC05    001662         345#
SYNC06    001706         356#
SYNC07    001732         367#
SYNC2A    001432         260#   1011*
SYNC2B    001434         261#   1013*
SYNC2C    001436         262#   1015*
SYNC2D    001440         263#   1017*
SYND00    001522         292#
SYND01    001546         303#
SYND02    001572         314#
SYND03    001616         325#
SYND04    001642         336#
SYND05    001666         347#
SYND06    001712         358#
SYND07    001736         369#
S.C     = 050000          77#
TABLE     010330        1413    1434    1465#
TEMP      005562         708     858*    859*    971#
TEMP1     001246         152#    414*    415     420*    962    1193*   1194*
TEMP2     001250         153#    415*    416     964
TEMP3     001252         154#   1363*   1372    1997*   2013*   2034*   2037*   2041*   2057*   2080*   2083    2097*
TEMP4     001254         155#
TEMP5     001256         156#   3112    3114    3119    3121    3148    3150    3155    3157
TESTER    010064        1420#   1423    1441    2965
TKCSR     001204         127#    529     588     914     921     942    1332*   1365    1446    1480*   1483    1484    3207
TKDBR     001206         128#    519     531     590     596     766     923     944    1367    1448    1457    3207
TKRDY     022760        1337    3099    3129    3137    3159    3168    3174    3181    3207#
TLAST   = 020450        1090    3277#
TOTAL     007276        1248#   2185*   2202    2581    2635    2689    2743    2798    2852    2906
TPCSR     001210         129#    572     594     773     928    1476    3207
```

```
TPDBR    001212       130#    574*    596*    775*    930*   1368*   3207*
TRMRDY=  000002      1233#   2303    2311    2444    2452    2463    2642    2650    2803    2811    2822
TRPOK    003762       754#
TSTNO    001226       140#    391*    843     870    1075    1082    1084    1323*   1474*   1510*   1537*   1564*   1591*
                     1617*   1645*   1666*   1687*   1710*   1731*   1752*   1773*   1794*   1815*   1836*   1857*   1877*
                     1903*   1933*   1982*   2026*   2069*   2111*   2166*   2244*   2291*   2338*   2385*   2433*   2480*
                     2527*   2573*   2627*   2681*   2735*   2790*   2844*   2898*   2964*
TST1     007310      1078    1094    1323#
TST10    011600      1618    1645#
TST11    011666      1646    1666#
TST12    011754      1667    1687#
TST13    012050      1688    1710#
TST14    012140      1711    1731#
TST15    012230      1732    1752#
TST16    012320      1753    1773#
TST17    012410      1774    1794#
TST2     010770      1324    1442    1474#
TST20    012476      1795    1815#
TST21    012564      1816    1836#
TST22    012652      1837    1857#
TST23    012740      1858    1877#
TST24    013026      1878    1903#
TST25    013124      1904    1933#
TST26    013326      1934    1982#
TST27    013510      1983    2026#
TST3     011126      1475    1510#
TST30    013674      2027    2069#
TST31    014052      2070    2111#
TST32    014304      2112    2166#
TST33    014650      2167    2244#
TST34    015050      2245    2291#
TST35    015250      2292    2338#
TST36    015450      2339    2385#
TST37    015650      2386    2433#
TST4     011220      1511    1537#
TST40    016046      2434    2480#
TST41    016244      2481    2527#
TST42    016442      2528    2573#
TST43    016666      2574    2627#
TST44    017112      2628    2681#
TST45    017336      2682    2735#
TST46    017562      2736    2790#
TST47    020004      2791    2844#
TST5     011312      1538    1564#
TST50    020226      2845    2898#
TST51    020450      2899    2964#   3277
TST6     011404      1565    1591#
TST7     011476      1592    1617#
TTST     002702       456*    457*    459*    460*    527#
TURFLG   007260      1241#   1340*   1344*   2186    2246    2293    2340    2387    2435    2482    2529    2575    2629
                     2683    2737    2792    2846    2900    2966
TWOSYN=  010000        81#
TXBAP    023206      3001    3013    3073    3249#
TXTAB    023606      2989    2994    3037    3038    3250#
TYPDAT   004266       797     815     818#
TYPE   = 104402       195#    408     413     426     431     455     463     476     477     479     481     483     571
```

```
                         584      601      694      731      798      799      802      803      805      807      811      816      861
                         918      920      948      986     1069     1087     1092     1176     1336     1362     1387     1395     1425
                        3098     3105     3124     3128     3136     3158     3167     3173     3180     3205
TYPMSG  004166           795      798#
VECMAP  007104          1175     1183#
WRDCNT  003742           702*     732*     740#
WRKO.F  004254           810      813#
XBX     004060           772      774      776#
XCSR    002604           478      500#
XERR    002626           484      509#
XFR   = 030000            75#
XHEAD   005461           413      960#
XPASS   002620           482      506#
XSTATQ  005506           419      960#
XTSTN   004374           804      841#
XVEC    002612           480      503#
XXLIN   023044          1391     3107     3126     3207#
$CRAP = 177777             1#    1466#    1470#    1503#    1506#    1530#    1533#    1557#    1560#    1584#    1587#    1610#    1613#
                        1638#    1641#    1659#    1662#    1680#    1683#    1703#    1706#    1724#    1727#    1745#    1748#    1766#
                        1769#    1787#    1790#    1808#    1811#    1829#    1832#    1850#    1853#    1870#    1873#    1896#    1899#
                        1923#    1929#    1975#    1978#    2018#    2022#    2062#    2065#    2103#    2107#    2157#    2162#    2235#
                        2240#    2282#    2287#    2329#    2334#    2376#    2381#    2424#    2429#    2471#    2476#    2518#    2523#
                        2564#    2569#    2618#    2623#    2672#    2677#    2726#    2731#    2781#    2786#    2835#    2840#    2889#
                        2894#    2942#    2960#
$E    = 000053             1#    1324     1325#    1475     1476#    1511     1512#    1538     1539#    1565     1566#    1592     1593#
                        1618     1619#    1646     1647#    1667     1668#    1688     1689#    1711     1712#    1732     1733#    1753
                        1754#    1774     1775#    1795     1796#    1816     1817#    1837     1838#    1858     1859#    1878     1880#
                        1904     1906#    1934     1936#    1983     1985#    2027     2029#    2070     2072#    2112     2114#    2167
                        2169#    2245     2246#    2292     2293#    2339     2340#    2386     2387#    2434     2435#    2481     2482#
                        2528     2529#    2574     2575#    2628     2629#    2682     2683#    2736     2737#    2791     2792#    2845
                        2846#    2899     2900#    2966#
$N    = 000051             1#    1321     1325#    1466     1472     1476#    1503     1508     1512#    1530     1535     1539#    1557
                        1562     1566#    1584     1589     1593#    1610     1615     1619#    1638     1643     1647#    1659     1664
                        1668#    1680     1685     1689#    1703     1708     1712#    1724     1729     1733#    1745     1750     1754#
                        1766     1771     1775#    1787     1792     1796#    1808     1813     1817#    1829     1834     1838#    1850
                        1855     1859#    1870     1875     1880#    1896     1901     1906#    1923     1931     1936#    1975     1980
                        1985#    2018     2024     2029#    2062     2067     2072#    2103     2109     2114#    2157     2164     2169#
                        2235     2242     2246#    2282     2289     2293#    2329     2336     2340#    2376     2383     2387#    2424
                        2431     2435#    2471     2478     2482#    2518     2525     2529#    2564     2571     2575#    2618     2625
                        2629#    2672     2679     2683#    2726     2733     2737#    2781     2788     2792#    2835     2842     2846#
                        2889     2896     2900#    2942     2962     2966#    3277#
$Y    = 000017             1#     182#     191      193#     195#     197#     199#     201#     203#     205#     207#     209#     211#
                         213#     215#     217#     219#     221#
.     = 025436            92#      93       96#     103#     104#     105#     106#     109#     111#     114#     118#     120#     165#
                         166#     167#     168#     169#     170#     281#     283#     284#     285#     286#     287#     288#     289#
                         290#     291#     292#     294#     295#     296#     297#     298#     299#     300#     301#     302#     303#
                         305#     306#     307#     308#     309#     310#     311#     312#     313#     314#     316#     317#     318#
                         319#     320#     321#     322#     323#     324#     325#     327#     328#     329#     330#     331#     332#
                         333#     334#     335#     336#     338#     339#     340#     341#     342#     343#     344#     345#     346#
                         347#     349#     350#     351#     352#     353#     354#     355#     356#     357#     358#     360#     361#
                         362#     363#     364#     365#     366#     367#     368#     369#     433      522      769      851      860
                         874      912#     922      929      943      970#     972#     974#     988     1179     1200     1249#    1250#
                        1252#    1349     1371     1431     1447     1465#    1477     1490     1494     1518     1525     1545     1552
                        1572     1579     1599     1606     1625     1634     1960     1992     2134     2139     2183     2201     2212
                        2217     2279     2326     2373     2420     2467     2514     2561     2611     2665     2719     2773     2826
                        2880     2934     3033     3089     3090#    3092#    3132     3184     3193     3202     3207#    3248#    3249#
```

```
                                3250#   3251#
.BEGIN  002332                   449#
.CNVRT  003542                   210     695#
.CONVR  003536                   208     694#
.DATAC  004576                   220     900#
.DELAY  004476                   216     871#
.EOP    002436                   471#   1432
.ERRTA  025364                   790    3270#
.HLT    004002                    99     763#
.INSTE  003224                   200     601#
.INSTR  003120                   198     580#
.INST1  003140                   584#    604
.MSG    003142                   582*    585#
.MSTCL  004556                   212     892#
.PARAM  003244                   202     612#
.PFAIL  004402                    97     382      848#     856
.RAMCL  004516                   214     879#
.RES05  003504                   206     683#
.ROMCL  004566                   218     896#
.SAV05  003444                   204     669#
.SCOPE  002634                   192     516#
.SCOP1  003020                   194     554#
.START  001742                   115     380#     392
.TRPSR  003750                   101     751#
.TRPTA  001314                   190#    756
.TYPE   003044                   196     564#
```

```
DVEND       1#     465
DVFRNT      1#
HLT        55#     909    1491    1495    1498    1519    1526    1546    1553    1573    1580    1600    1607    1626    1635
         1656     1677    1697    1721    1742    1763    1784    1803    1824    1845    1866    1889    1917    1952    1969
         2010     2054    2088    2095    2140    2143    2150    2218    2221    2228    2268    2280    2315    2327    2362
         2374     2409    2421    2456    2468    2503    2515    2550    2562    2600    2612    2654    2666    2708    2720
         2762     2774    2815    2827    2869    2881    2923    2935    3057    3070    3081    3219    3245
INTS     1465#    1786    1807    1828    1849
MUXS1       1#    2235    2282    2329    2376    2564    2618    2672    2726
MUXS2       1#    2423    2470    2517    2780    2834    2888
NOINT    1466#    1702    1723    1744    1765
$BUFFE      1#     966
$CK15       1#
$CK150      1#    3211
$CLR.T      1#
$CYCLE      1#     975
$EGOLF   1502#    1529    1556    1583
$EOP        1#     465
$FINI       1#    3277
$GETFL      1#
$GETPA      1#    1070
$HEADE      1#
$MSG        1#     960
$PFAIL      1#     844
$RAMCL      1#     871
$RXSHI      1#
$SCOPE      1#     512
$SETLI      1#
$SETSC      1#
$SETSY      1#
$SET.T      1#
$SILOI      1#
$SIMBC      1#
$TRPDE      1#     191     193     195     197     199     201     203     205     207     209     211     213     215     217
          219
$TSTN       1#    1321    1472    1508    1535    1562    1589    1615    1643    1664    1685    1708    1729    1750    1771
         1792     1813    1834    1855    1875    1901    1931    1980    2024    2067    2109    2164    2242    2289    2336
         2383     2431    2478    2525    2571    2625    2679    2733    2788    2842    2896    2962
$TXSHI      1#
$VARIA      1#     117
$XZ         1#    1466    1470    1503    1506    1530    1533    1557    1560    1584    1587    1610    1613    1638    1641
         1659     1662    1680    1683    1703    1706    1724    1727    1745    1748    1766    1769    1787    1790    1808
         1811     1829    1832    1850    1853    1870    1873    1896    1899    1923    1929    1975    1978    2018    2022
         2062     2065    2103    2107    2157    2162    2235    2240    2282    2287    2329    2334    2376    2381    2424
         2429     2471    2476    2518    2523    2564    2569    2618    2623    2672    2677    2726    2731    2781    2786
         2835     2840    2889    2894    2942    2960

. ABS.  025436     000

 ERRORS DETECTED:  0

 CZDVEC,CZDVEC/SOL/CRF/DOC=CZDVEC.MAC,CZDVEC.P11
 RUN-TIME: 26 39 4 SECONDS
 RUN-TIME RATIO: 330/69=4.7
```

```
CORE USED:  18K  (35 PAGES)

DOCUMENT PAGES:  83
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